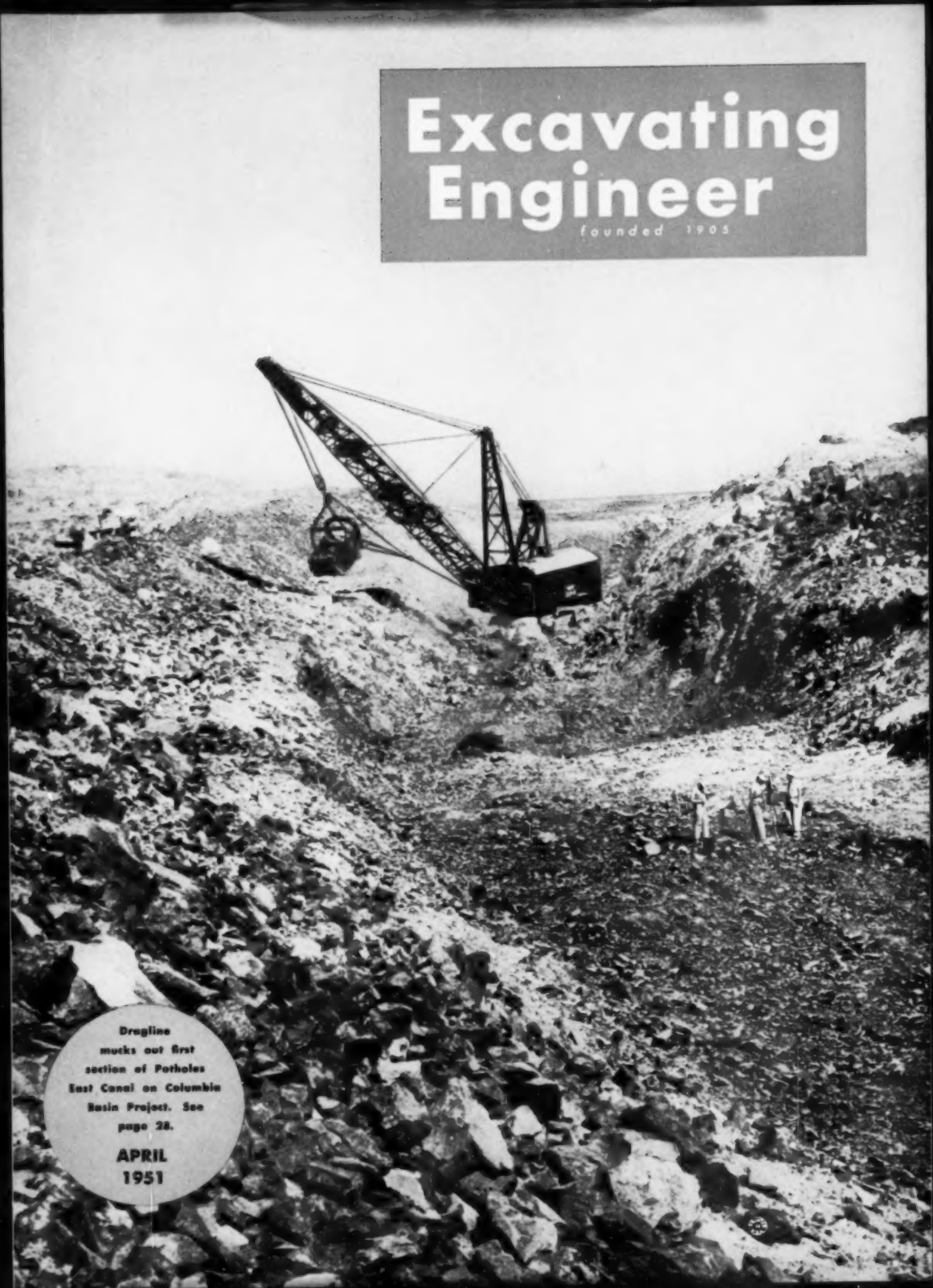
Excavating Engineer

founded 1905



Dragline mucks out first section of Potholes East Canal on Columbia Basin Project. See page 28.

APRIL 1951

Query the Quarries . . .

. . . you'll find that leading quarry operators everywhere rate Bucyrus-Erie excavators outstanding for output, economy, and dependability in rock. See your Bucyrus-Erie distributor for full information on Bucyrus-Erie gas, diesel and single motor electric ⅜ to 4 yard excavators.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

213X50C

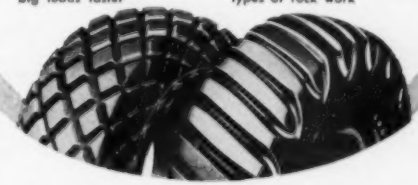
BUCYRUS ERIE

Count on this tire to cut costs!

Two more reasons why It Pays to BUY and SPECIFY GOODYEAR!

ALL-WEATHER
Finest for flotation, rolling big loads faster

HARD ROCK LUG
Super-tough champ for all types of rock work



OPERATING costs go d-o-w-n when you use the Goodyear Sure-Grip, the tire you *know* you can depend on for long, *uninterrupted, economical* service.

Sure-Grip is First Choice with cost-conscious construction men because its specially engineered O-P-E-N C-E-N-T-E-R tread and extra-massive, balanced lug bars make it tops for drive-wheel traction—tops in terms of low cost per cubic yard, low cost per operating hour — *over-all low cost that makes your equipment earn more for you!*

GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD" – Every Sunday – ABC Network

Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

50 LB. 1¼ X 8
HERCULES
GELAMITE
2
50 LB. 1¼ X 8
HERCULES
HERCOMITE
4
GET MORE E.P.* PER DOLLAR
*Explosive Power determines your dynamite dollar's true value. Get more for your money with Hercules Hercomites® and Gelamites®. They give better breakage than older-type explosives . . . are more economical than extra dynamites and gelatins. Among them, there is one for practically every mining, quarrying, and construction need. Write for illustrated booklet, "Hercomites and Gelamites for Lower Blasting Costs."
HERCULES POWDER COMPANY 972 King Street, Wilmington, Delaware
EXPLOSIVES DEPARTMENT

Advertisers IN THIS ISSUE

Allis-Chalmers Mfg. Co. 38-39
American Brake Shoe Co.,
Amer. Manganese Steel Div. 49
American Chain & Cable Co.,
Hazard Wire Rope Division ..4th Cover
American Hoist and Derrick Co. 46
American Steel & Wire Co. 16
American Steel Dredge Co., Inc. 43

Blaw-Knox Company 41
Bucyrus-Erie Company .....2nd Cover
14-15, 45, 54, 61
Buda Company, The 12

Caterpillar Tractor Company 53
Colorado Fuel & Iron Corp.,
The Wickwire Spencer Steel Div. .. 7
Cooper-Bessemer Corp., The 6

Drake-Williams-Mount 52

Easton Car and Construction Co. 35
Erie Steel Construction Co. 60
Euclid Road Machinery Co., The 37

For Sale (Classified) 63
L. B. Foster Company 60

General Electric Company 11
Goodyear Tire & Rubber Co., The 1

Hayward Company, The 64
Hazard Wire Rope Division,
American Chain & Cable Co. ..4th Cover
Hercules Powder Co., Inc. 2
Hough Company, The Frank G. 10

International Harvester Co. 32-33

Jaeger Machine Co. 46
Johnson Company, The C. S. 50-51

Koehring Company 50-51

LaCrosse Trailer Corp. 55
A. Leschen & Sons Rope Company ... 59
LeTourneau, Inc., R. G. 8-9

Macwhyte Company 13
Marion Power Shovel Company 47
Martin Machine Co. 57

Northwest Engineering Co. 5

Ottawa Steel Products, Inc. 44

Rogers Brothers Corporation 40

Saverman Brothers, Inc. 34
Schield Bantam Company, Inc. 43
Sherman Products 56

Timken Roller Bearing Co., The ..3rd Cover

U. S. Savings Bonds 4
United States Steel 16

Wellman Engineering Co., The 62
Wickwire Spencer Steel Div.,
The Colorado Fuel & Iron Corp. ... 7

Excavating Engineer

founded 1905

CONTENTS

Volume XLV No. 4 **April, 1951**

Efficient Haulage 17

Detailed records kept over a period of years point the way to more efficient haulage practices at the National Lead Co. open-cut ilmenite-magnetite mine, Tahawus, N. Y. (Condensed from Bureau of Mines Information Circular 7584 by Robert S. Sanford.)

Columbia River Gets Coat of Armor — by W. J. Granberg 21

Quebec Spans A Traffic Problem — by E. T. Nesbitt 22

Cutting through 200,000 yards of rock and shale to build a new bridge on the Chaudiere River, and placing a new traffic deck on the 3,240-ft. St. Lawrence span, Quebec solves a traffic problem on the southwest side of the city.

Pittsburgh's New 16-Building VA Hospital 26

Atop one of Pittsburgh's many hills, a big new hospital is rising for the Veterans Administration. James McHugh Construction Co., Chicago, has the $20 million job well under way.

News from the Field 28

Blast Pathway for Water 28
A.G.C. Presents 88 Awards for Accident Prevention 28
Bury Canal Lining 29
Construction Equipment Outlook for 1951 30
Materials Handling Meet in Chicago 34
Seaners Rebuild US 66 34
Heavy Equipment on Display at British Fair 34
Army Plans 210 Projects 34

Equipment You Ought to Know About 42

Not in the Contract 48

Notes from the Manufacturers 52

New Trade Literature 56

Ex-Laffs 58

COPYRIGHT 1951 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

Regular Subscription (payable in advance): 35 cents per copy, $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscription. Indexed by Engineering Index, Inc.

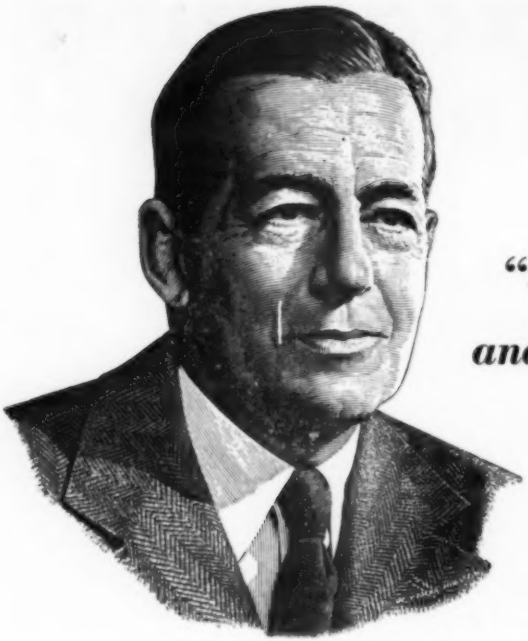
Published Monthly by

THE EXCAVATING ENGINEER PUBLISHING COMPANY

South Milwaukee, Wisconsin, U. S. A.

E. M. HEUSTON, Publisher
W. C. VAN DYKE, Editor
M. B. JAEGER, Managing Editor
E. W. ARNDT, Art Editor
H. A. BURKHARDT, Sales Manager
R. C. REYNOLDS, Assistant Editor
C. A. PETERSON, Assistant Editor

CCA Member Controlled Circulation Audit



"Freedom of thought and independence of action..."

DONALD W. DOUGLAS

President, Douglas Aircraft Company, Inc.

"Freedom of thought and independence of action are among the keynotes of America's economy. They are fundamental to our way of life. Systematic savings through the Payroll Savings Plan help the individual maintain his own independence and freedom of action and make us strong as a nation."

In more than 21,000 large companies (employing 100 or more) and in many smaller companies, more than 8,000,000 men and women are helping to keep America strong. By systematic saving in U. S. Savings Bonds they are doing their part to offset inflationary tendencies . . . they are building a reservoir of future purchasing power to support industry...they are providing financial independence for themselves and their families.

The widespread success of the Payroll Savings Plan is an excellent example of our freedom of thought and independence of action. Far-sighted employers *offered* these 8,000,000 Americans an *opportunity* to enroll in the Payroll Savings Plan. There was no pressure, no emotional stimulation. A Payroll Savings Plan application was placed before them. They "signed up"—to the benefit of themselves, their companies and their country.

Has *every* man and woman in your company been *offered* an opportunity to share in the benefits of the Payroll Savings Plan? How about the newer employees? How about those who did not sign before but may wish to do so now? Delegate one of your top executives to conduct a person-to-person canvass of your employees to make sure that *every* man and woman gets an application blank. You don't have to urge them to enroll, or to increase their present allotment—they are anxious to build for their own independence.

Get in touch with your State Director, U. S. Treasury Department, Savings Bonds Division. He is ready to help you—with a package plan that reduces your work to the minimum.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the G. M. Basford Company and

Excavating Engineer

ELIMINATE THE SHOCK OVERLOADS

NORTHWEST ADVANTAGES MEAN LOWER OPERATING COSTS

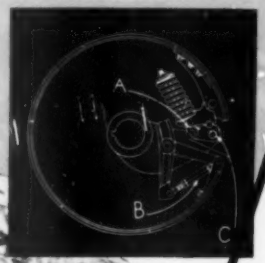
BEFORE THE DAMAGE IS DONE!

● THE Northwest Cushion Clutch in the Main Drum Clutch, eliminates *shock overloads before* the overload reaches the machinery, not *after* they have been carried through the machinery with resulting strain and possible damage.

The Northwest Cushion Clutch reduces overloads on the drum shaft and associated parts. It results in reduced frequency of adjustments. It lengthens machine life and puts money in your pocket by reducing wear and tear.

Protective devices at this point (between the engine and operating machinery) act after the shock load has passed through shafting and gearing. The Northwest Cushion Clutch catches the overload caused by the inertia stored in the rotating parts ahead of the engine.

The Cushion Clutch is a simple, positive device. The joint at "A" remains closed until overload point is reached. An overload causes the joint to open through the driving pin "C" and the clutch slips enough to cushion the shock of the load. The clutch is adjusted by the turnbuckle "B" There is no other adjustment.

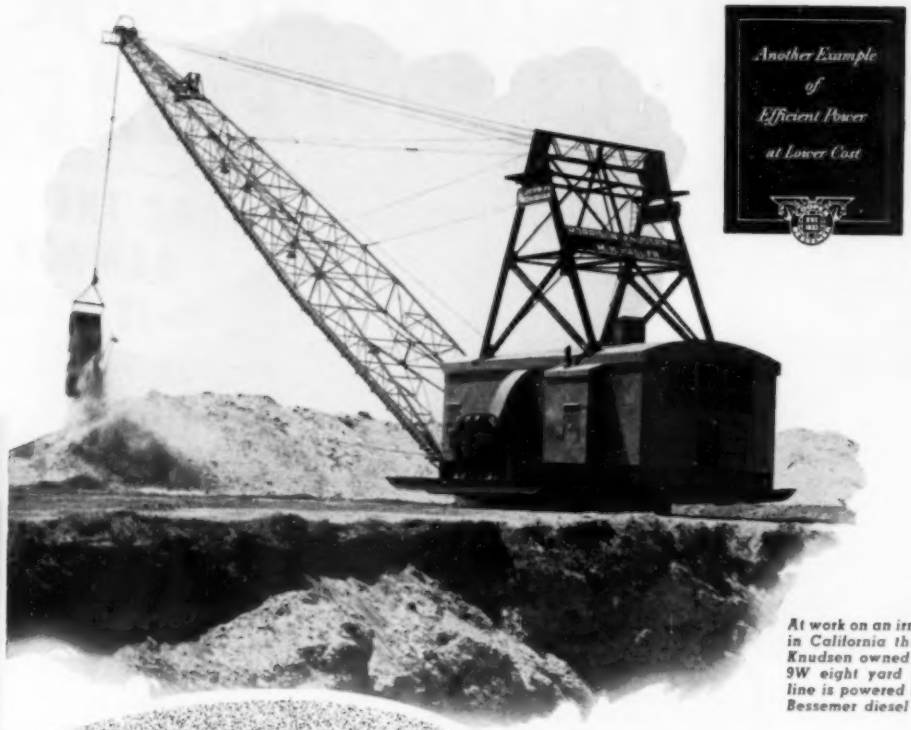


NORTHWEST ENGINEERING COMPANY
1506 Field Building, 135 South La Salle Street
Chicago 3, Illinois

Your Northwest is a real Rock Shovel and if you have a real Rock Shovel you never have to worry about output in any other kind of digging.

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



At work on an irrigation canal in California this Morrison-Knudsen owned Bucyrus-Erie 9W eight yard bucket dragline is powered by a Cooper-Bessemer diesel engine.

PEAK AVAILABILITY

ANOTHER Cooper-Bessemer BONUS VALUE

• Availability is one of the yardsticks that determine the real worth of a heavy duty diesel. Right?

The exceptional availability demonstrated time and again by Cooper-Bessemer diesels results from a combination of many factors... *too many* to permit adequate description here. Included are such things as advanced metallurgy for high strength construction, oversize crankshafts, unequalled bearing areas, precision-honed cylinders, tin-plated pistons, unique "cocktail shaker" piston cooling... and a whole raft of other equally important features. They add up to continuous performance... trouble-free service with a very minimum of maintenance.

Whatever your power need... mobile, stationary, locomotive, marine... you'll be ahead with a Cooper-Bessemer. Get *all* the facts. Check with the nearest Cooper-Bessemer office.

The **Cooper-Bessemer** Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. Calmes Engineering Co., New Orleans, La. Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis

ALL ROPES *look* ALIKE... but

IN *Wickwire Rope*

Precision polishing and high powered magnification enable us to go 100 times beyond normal vision in examining Wickwire Rope steel for classification of grain size to McQuaid-Ehn* standards.

TESTING GOES

100 times beyond normal vision

Uniformity of grain size in steel assures longer life and greater reliability in Wickwire Rope.

Right down the line...starting with the melting and refining of our steel ...and continuing through heat treating processes and cold drawing of the wire, we maintain complete control over the grain size of steel used in Wickwire Rope.

This quality control of basic properties is possible only with a company whose operations are fully integrated from the actual making of the steel to the stranding of the finished rope. It's just one more example of how Wickwire goes "beyond specifications" to give you—at market prices—wire rope that is unsurpassed for reliability, safety and longer life.

See your local Wickwire distributor for the right rope for your particular requirements. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed.

*For detailed information on the McQuaid-Ehn test and what it means to you in superior rope performance, write to Wire Rope Sales Office, Wickwire Spencer Steel Division of C. F. & I., Palmer, Mass.

WICKWIRE ROPE CF&I

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. **EXECUTIVE OFFICE**—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Casper • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Houston • New York Odessa (Tex.) • Philadelphia • Phoenix • Salt Lake City • Tulsa

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

"FINEST

8'x 8' top opening gives big target . . . reduces spillage of rock and dirt at cut-off trench, saves shovel swings.

Tournahopper dumps riprap through wide 8' opening . . . then turns 90° to clear. Clearance is 22" under open doors.

W. E. Logan & Sons of Muskogee, Oklahoma, report their 2-year, 4,500,000-yd. contract on Tenkiller Ferry Dam across the Arkansas River near Gore is now well ahead of schedule. Main reason, say company officials, is the all-around, all-weather production ability of 3 LeTourneau 15-yard, bottom-dump C Tournahoppers.

The Tournahoppers have been used so far on 4 major types of work: (1) hauling sandy clay and gravel from conveyor belt loader, (2) hauling shovel-loaded, unshot rock from cut-off trench, (3) dumping rock fill in the coffer dam, and (4) placing riprap on the dam face.

On 4500' haul . . . makes 8 trips an hour

When loaded by conveyor, each Tournahopper carries 12½ pay yards per trip . . . completes typical 9000-ft. cycles in 7.68 minutes. Hourly production on this haul averages 100 pay yards per machine, according to Contractor "Easy" Logan . . . combined output for the 3 rigs with loader is 300 yards hourly.

On cut-off trench assignment, now completed, the Tournahoppers moved approximately 80,000 yards of rock and 20,000 yards of moist dirt. Working under a 2½-yd. shovel, each "C" hauled 10 pay yards of mixed material per load . . . delivered 8 loads per hour on a 2000-ft. cycle

Send **NOW to: R. G. LeTOURNEAU, INC., Peoria, Illinois**

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

Type of work to be handled _____

. . . for complete information on new

- ☐ bottom-dump Tournahoppers
  - ☐ 15-yd. ☐ 27-yd.
- ☐ rear-dump Tournarockers
  - ☐ 9-ton ☐ 16-ton ☐ 35-ton
- ☐ Tournapulls
  - ☐ 7-yd. ☐ 15.5-yd. ☐ 30-yd.

LeTOURNEAU

LET

all-around hauling units I've ever seen"

says "Easy" Logan

This is typical of the very soft haul footing being licked by Tournahoppers. Average time of 7.58 minutes on 9000' cycle includes .31 min. to load under conveyor, 1.01 min. to get on and off soft fill, and .17 min. to spread. Haul speed averages 17 m.p.h.

despite soft, slick roads which held haul speeds well below normal. Combined output here averaged 240 pay yards per hour for the 3 rubber-tired rigs.

When heavy rains made these two sections impossible to work, the 180 h.p. Tournahoppers moved onto riprap placement where moisture control was no problem. In 4 months, the 3 "C's" windrowed 22,000 cubic yards of rock... much of it handled under weather conditions which stopped all other haul units. Operating efficiency for the Tournahoppers in 800 hours of work has been 95%. No wonder Mr. Logan claims they're "the finest all-around hauling units I've ever seen."

Has 11 electric rigs on dam

In addition to the 3 Tournahoppers, Logan, a LeTourneau equipment user since 1936, has 8 electric-control Tournapulls at Tenkiller Ferry Dam... 3 new 13.5-yd. "C's" and 5 big 30-yd. "B's". All 11 units were driven to the job site over paved highways from the nearest railhead.

Like Logan, you'll find it pays to standardize on Tournahoppers and Tournapulls for lowest-net-cost-per-yard. Ask your LeTourneau Distributor to show you what these modern, rubber-tired rigs can do to increase production and lower costs on *your* work. Call or write TODAY.

Read what the men on this job say about TOURNAHOPPERS

E. E. Logan, Partner..."Our C Tournahoppers have paid for themselves on this one job. No other machine could have handled the riprap and rock work in the cut-off section without costing us too much money. The Tournahoppers have withstood this rough work much better than any other type of hauling unit would have done... Tournahopper's electrical system is far superior to other power methods used to operate hauling and scraper units, with much more positive control. We can operate the machines better, maneuver better, and work in footing conditions where other units cannot be used... As far as I'm concerned, the C Tournahopper is very satisfactory for all types of haulage conditions and materials and I recommend it very highly."

A. C. Logan, Partner..."These Tournahoppers are very maneuverable and work well under both loader and shovel. The machine works much better on soft fills than 4-wheeled front-end hauling units. Its electric steer is a big help in tough conditions."

Charles Wills, Shop Foreman..."The upkeep and maintenance on the C Tournahoppers has been less than on any other hauling machine we've ever used... and much less than the upkeep and maintenance on the other type hauling units we've been running with the Tournahoppers. The 'C's' electrical system has my vote as the best way of operating any dirtmover. It's easy to work on, and the machines can do things no other type of unit could even start to do."

Ed Brown, Asst. Shop Foreman..."Mechanically, these machines have been just about perfect. Have had very little down-time for any reason. The electrical system has been 100% efficient. I'd rather work 10 to 1 on the C Tournahopper or C Tournapull than on any other type of hauling unit used on our job."

Robert Wright, Operator..."I like these machines because they handle so easily... it's the easiest-operating rig I've ever been on."

A. C. Kirk, Operator..."You can turn the Tournahopper on a dime."

Perry Johnson, Operator..."We work these rigs in places you could hardly get a mule through."

J. R. Cato, Operator..."I can position my Tournahopper under the loader quicker with this machine. It sure is easy to handle."

Tournarocker, Tournahopper—Trademark
Tournapull, Carryall—Trademark Reg. U.S. Pat. Off. C145

LETOURNEAU TOURNAHOPPERS

PEORIA ILLINOIS

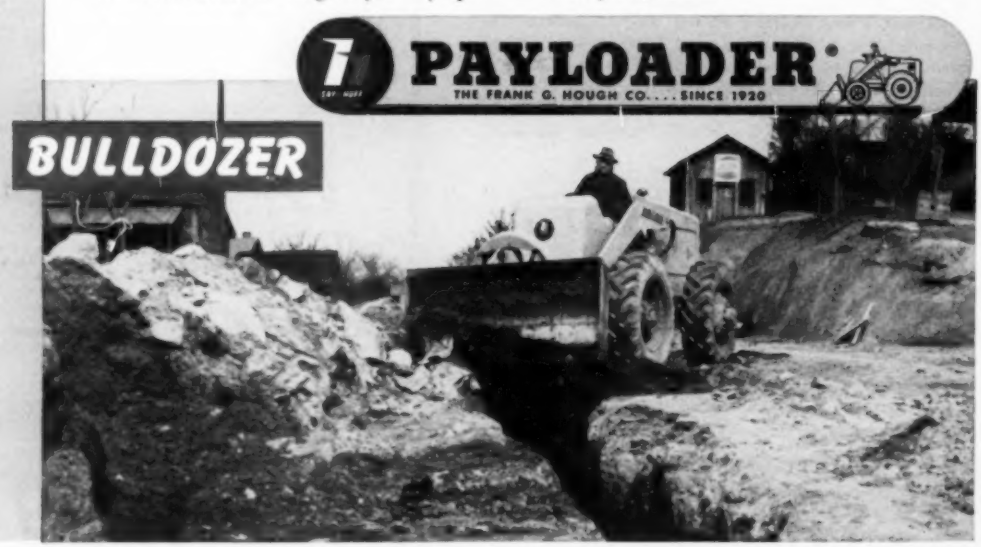
HIGH SPEED ON RUBBER PLUS TRACTION ADVANTAGES OF A CRAWLER

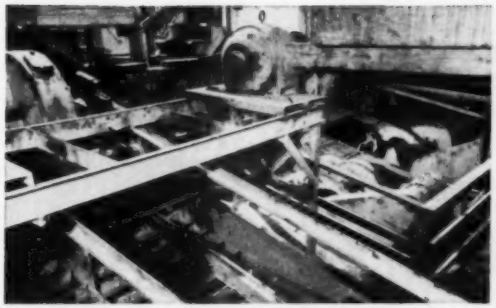
PAYLOADERS ON RUBBER

Get the Job Done FAST....

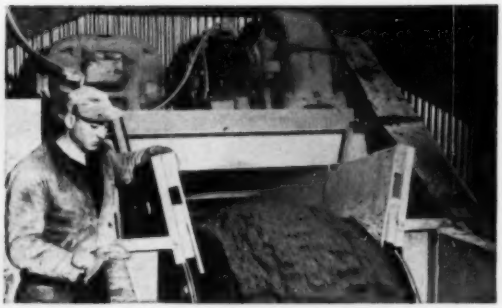
This big 1½ yd. HM PAYLOADER with its combination of large pneumatic tires and 4-wheel drive gives you fast-action traction on all kinds of footing — on sand, stone, snow, clay or mud. It gives you crawler-like traction at far less maintenance expense, PLUS speed when you want it and the ability to work on pavements and to travel over streets and highways at 16 m.p.h.

This PAYLOADER also gives you easy operation and maneuvering speed with its power-boosted steering and full-reversing transmission having four speeds in reverse as well as forward. Once you see the Model HM in action you'll know why hundreds of contractors are its enthusiastic owners and boosters. Full information on this 1½ cu. yd. model and other size PAYLOADERS is yours for the asking. The Frank G. Hough Co., 708 Sunnyside Avenue, Libertyville, Illinois.



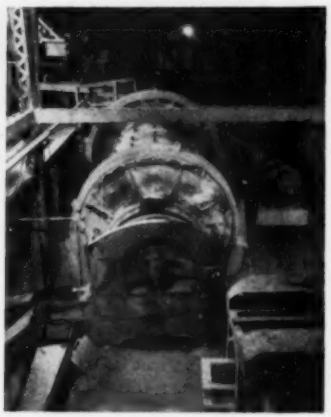


Aggregate under 6 inches is separated in shakers at screening plant. A G-E 5-hp motor drives shakers. Plant is completely automatic.



Carrying cement mix along this indoor conveyor system is a crucial step in construction of the dam. Sturdy G-E 100-hp motor drives the belt.

Aggregate for batching plant at Hungry Horse Dam is carried 1600 feet up the canyon wall by conveyor, driven by reliable G-E 100-hp motors in wooden sheds at intervals of 250 to 300 feet.



This Marcy rod mill, used in the gravel-crushing operation at the screening plant, is driven by a G-E 200-hp motor (right center). The motor is protected against heavy dust.

push-button aggregate processing at 700 tons/hr.

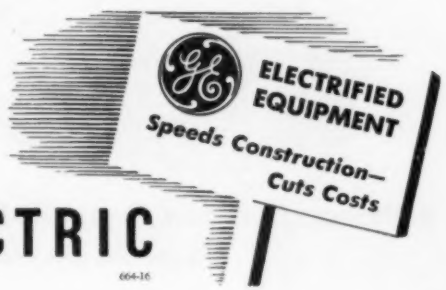
... Electrically

General-Shea-Morrison, contractors for the Bureau of Reclamation's Hungry Horse Dam, are going all-out with electric equipment. Best example is their aggregate plant with its network of interconnecting conveyors geared to process 700 tons of raw aggregate every hour. It's one of the most modern installations of its kind in the country—strictly a push-button operation from raw aggregate handling to mixing. Only with modern electric drives can this world's fourth largest dam be completed on schedule in 1952.

As time goes on, contractors are discovering more and more that it pays to electrify. With co-ordinated use of G-E motors and control and G-E power-distribution systems, they're getting safer, more flexible, and more efficient operation. *Apparatus Department, General Electric Company, Schenectady 5, N.Y.*

Ask him Today!

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job —at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.



GENERAL ELECTRIC

664-16

Get MORE POWER and LUGGING ABILITY into your earth-moving equipment and move dirt at lower cost per yard.

BUDA dyna-swirl DIESELS GIVE YOU:

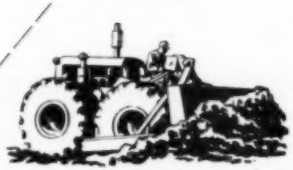
- 15-20% more power at the crankshaft
- 10-15% more piston displacement
- 10-20% more lugging ability
- Dyna-Swirl Combustion—lower fuel cost per horsepower

PLUS up to 6000 or more hours operation before overhaul!

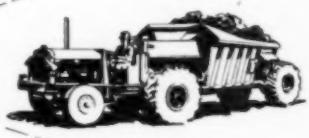
Get *all* the facts on Buda Diesels from your nearby Buda Distributor today. He can show you how Buda Diesels give you more horsepower hours per dollar. Write for Bulletins, data and Specifications. The Buda Company, Harvey, Illinois.

NEW BUDA *dyna-swirl* DIESELS FOR

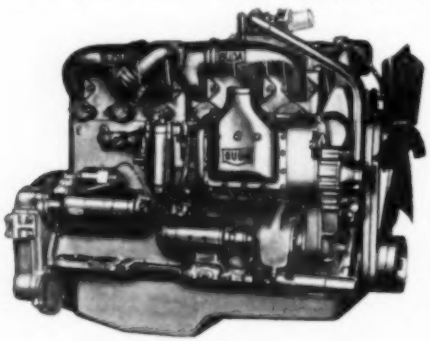
SCRAPERS



DOZERS



WAGONS



BC-10

a Power-Full and Dependable Name in Engines...

BUDA

For better service and more economy

Order from

a thousand and one

MACWHYTE WIRE ROPES

You'll get maximum service from wire rope that has been specially designed for each job. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. It will pay you to specify Macwhyte Wire Rope . . . engineered and job-proved for your particular equipment. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company.

MACWHYTE COMPANY

2903 Fourteenth Avenue, Kenosha, Wisconsin
Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles.
Distributors throughout U.S.A. and other countries carry stocks for immediate delivery.

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog on Request.

BIG RED

Beats Tough Loading — And Competition —

BUCYRUS ERIE

BLUE shale so hard it often had to be shot and ripped before loading . . . scraper maintenance costs way up, yardage output down . . . pushers not used to avoid damage to scrapers. That was the picture on a tough highway job until one of the contractor's International TD-24 Tractors was teamed with a Bucyrus-Erie B-250 scraper. Look what happened when the Big Red team went into action.

On a 60-day run, this 22-yd. outfit not only scraped out heaping loads of shale, but did it without blasting. Big Red team loads averaged 13.5 to 20% higher than competitive units — and two of these scrapers had greater apparent rated capacities than the B-250. Loading time of the B-250 averaged 1¾ minutes with a pusher. In spite of heavy shock loads, the B-250 showed no signs of failure.

This is one of many jobs on which the Big Red team has performed with complete satisfaction to the owner. Performance details on this job, or any other job on which records have been carefully compiled, are yours for the asking. Study these records . . . and let us demonstrate the Big Red team *on your own job*. Then you'll have convincing proof that this combination gives you the ultimate in crawler tractor earthmoving performance.

BUCYRUS-ERIE COMPANY

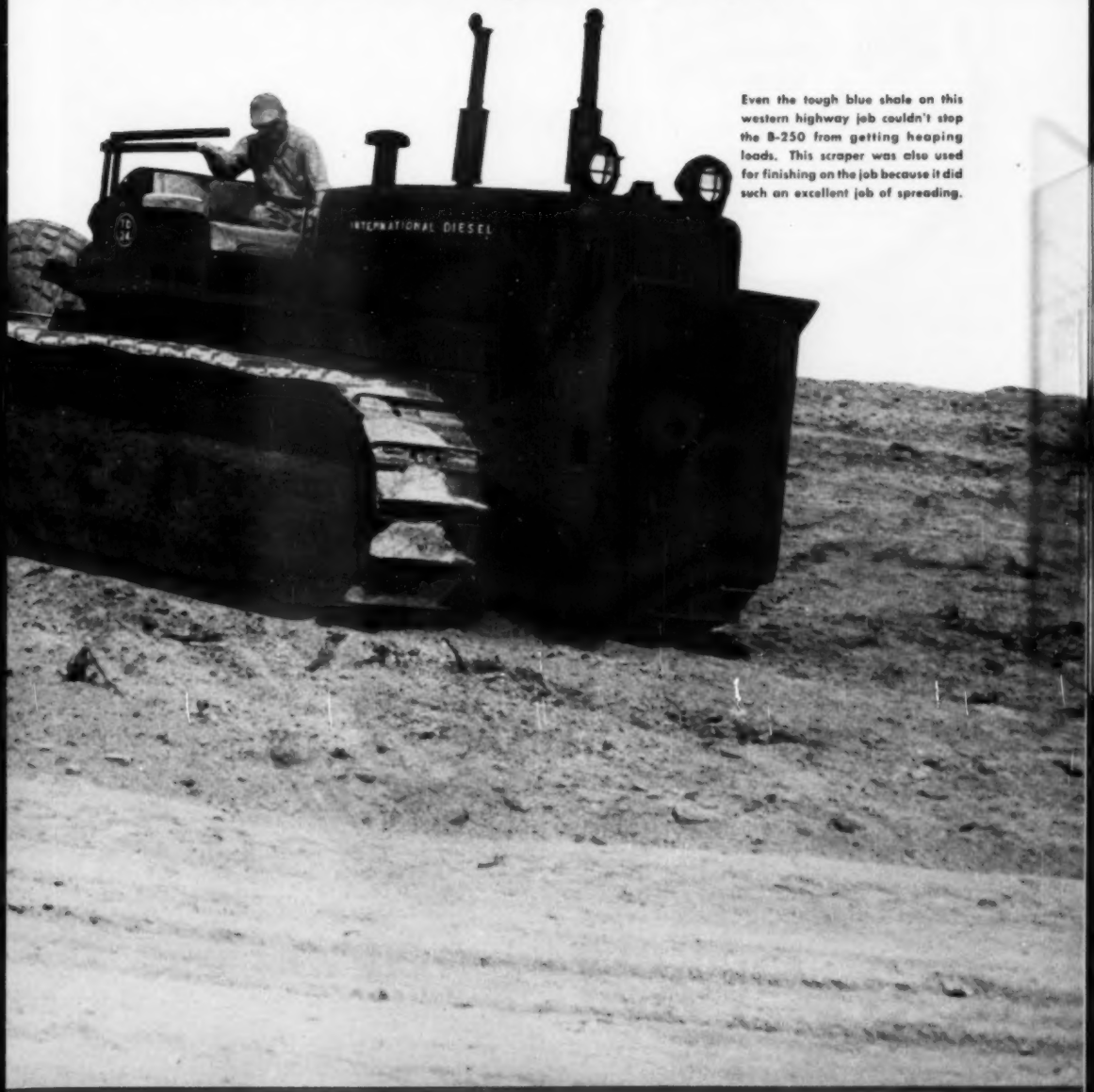
South Milwaukee, Wisconsin

244TS1C

See Your INTERNATIONAL

TEAM

On Million-Yard Highway Project



Even the tough blue shale on this western highway job couldn't stop the B-250 from getting heaping loads. This scraper was also used for finishing on the job because it did such an excellent job of spreading.

Industrial Tractor Distributor

How to pick the "Winner" for tough wire rope jobs!

SHOVEL ROPE—Tiger Brand 6 x 41 Lang Lay with Independent Wire Rope Core. Made only in Monitor grade. Has high abrasion and fatigue resistance. The wire core adds to its strength and prevents distortion. This Tiger Brand Rope has earned an enviable reputation where the digging is hardest.

• You can make money or lose it by the way you select wire rope. It's good to pick a rope like American Tiger Brand—that has proved its merits over a period of years—but that's only part of the story.

Some types of ropes are good in mud and sand—others are not. Some can stand bending fatigue caused by small sheaves, others break up under this abuse. The point is—can *you* tell by looking at a rope whether or not it will be a "winner" on your job?

Take a tip from the Tiger Brand Specialist

Here's a man who knows his ropes. He can tell you the construction that should be best for your particular needs. Don't hesitate to call him in. He has the experience to help you pick a winner . . . and the right rope for your job can cut your wire rope costs in half. Write for our handbook, "American Tiger Brand Wire Rope" which shows all the different constructions. Address American Steel & Wire Company, 842 Rockefeller Bldg., Cleveland 13, Ohio.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Truck Maintenance + Road Upkeep + Trained Drivers =

Efficient Haulage

Detailed records kept over a period of years point the way to more efficient haulage practices at the National Lead Co. open-cut ilmenite-magnetite mine, Tahawus, N. Y. (Condensed from Bureau of Mines Information Circular 7584 by Robert S. Sanford.)

HEAVY-DUTY ore trucks are replacing railroads at many large open-cut mines and even at a few underground mines. In view of the increasing trend toward truck — and especially heavy truck — haulage, the practices which have proved most effective at the National Lead Company's big open pit mine near Tahawus, N. Y., may serve as guideposts to other contractors.

The deposit is at Tahawus, Essex County, N. Y., on the east shore of Sanford Lake, which forms the headwaters of the Hudson River. It is in the heart of the Adirondack Mountains at an altitude of 1,800 feet.

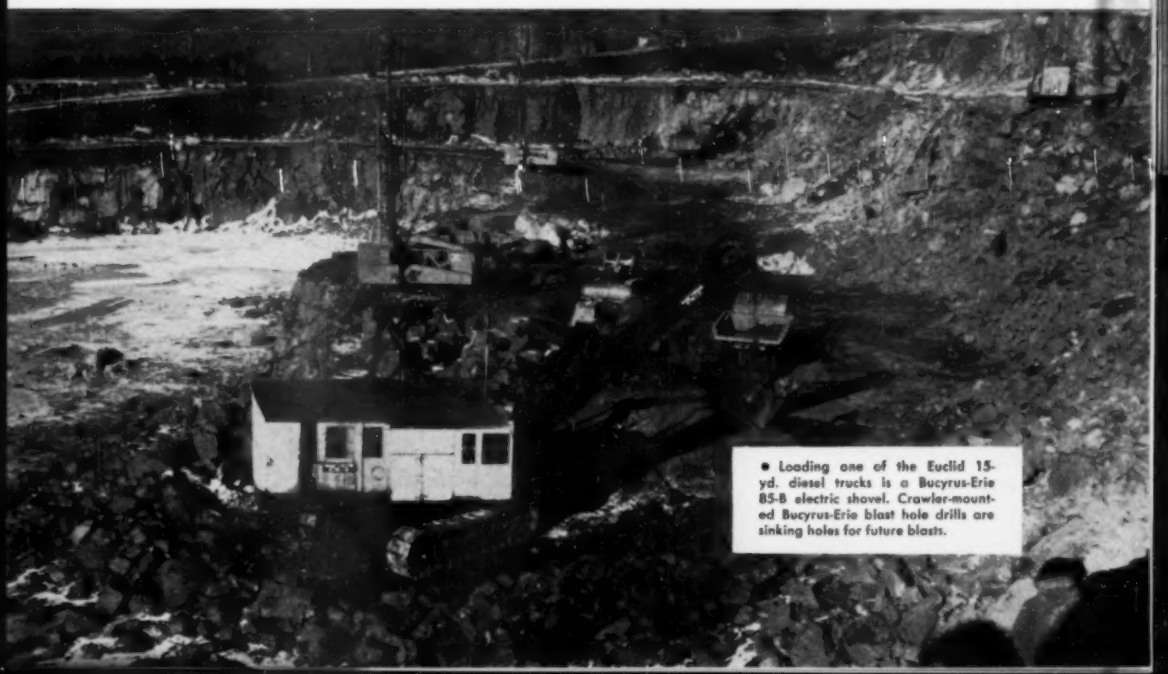
Archibald MacIntyre discovered iron ore in the area in 1826. He founded the Adirondack Iron & Steel Co., which started to produce iron in 1838 but failed in 1858.

The mine subsequently became the property of the MacIntyre Iron Co., which held it until 1941, when the National Lead Co. purchased the property and immediately started development. After completing 11,000 feet of diamond core drilling to delineate the ore body, the company started open-cut mining.

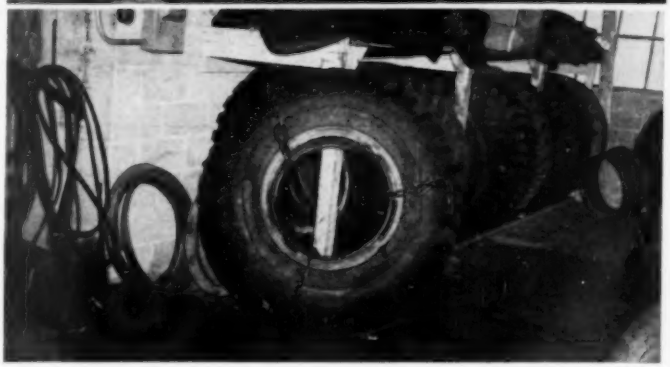
A 4,000 ton a day mill was erected south of Sanford Hill to process titaniferous magnetite ore and produce ilmenite concentrate and magnetite concentrate. Production began in July 1942.

Work Year 'Round

The mine is located in a climate that includes hard winters and an average annual snowfall of 129.1 inches. The company has overcome the cold weath-



• Loading one of the Euclid 15-yd. diesel trucks is a Bucyrus-Erie 85-B electric shovel. Crawler-mounted Bucyrus-Erie blast hole drills are sinking holes for future blasts.



• Tires are protected from wedging rocks by a steel arm hanging between the dual wheels. In the shop, chains are used to secure lock rims while a new tire is being inflated. *All photos courtesy Bureau of Mines.*

er to the extent that it operates the mine, concentrator, and sintering plant throughout the year.

The deposit at Sanford Hill is elliptical in plan, having a length of approximately 1,800 feet and a maximum width of 900 feet. The ore body is favorably situated for open-cut mining. It is on the west side of Sanford Hill and dips toward the lake. The open-cut mine has been developed along conventional lines by nine levels above and two levels below the elevation of the crusher.

The trend here, conforming to modern practice, has been toward heavier equipment. Among the major machine items are 14 diesel-powered end-dump trucks of 15-ton capacity, three of 22-ton capacity, two electric 2½-yd. shovels, a 4-yd. electric shovel and a 2½-yd. diesel shovel. Blast hole drilling is accomplished with five 9-in. crawler-mounted churn drills. A motor grader and four crawler tractors maintain haul roads as well as help police the pit.

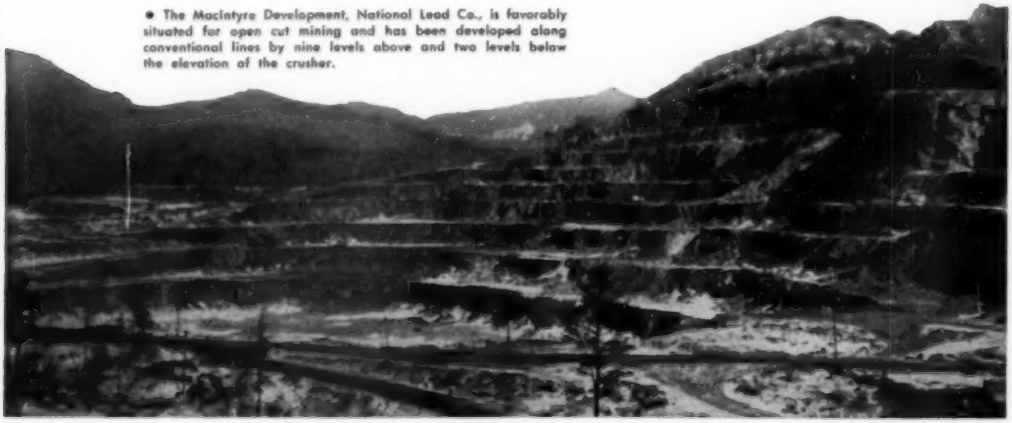
During the war the emphasis was on mining ore, and because of personnel and equipment shortages, waste stripping could not be maintained at the correct ratio. After the war a contractor was employed and the stripping was brought up to schedule. At present, all ore mining and waste stripping is done with company-owned equipment.

The hauling operation, which is continuous, consists of moving the ore to the crusher and transporting the waste to the dumps. Both ore and waste are carried by the fleet of 17 diesel powered end-dump trucks.

In analyzing its haulage over a seven year period, the company has concluded that the following factors contribute most to efficient low-cost truck haulage: (1) good trucks correctly designed for heavy loads and the impact of loading with power shovels; (2) good truck maintenance and an efficient repair shop; (3) smooth roads adequately maintained; (4) well-trained, careful truck drivers.

Create Stockpile

During 1949 — these studies cover the years 1942-1949 — an ore stock pile was created. Whenever two trucks were waiting at the crusher, the next truck dumped the ore on a nearby stock pile. After 15,000 tons had been ac-



• The MacIntyre Development, National Lead Co., is favorably situated for open cut mining and has been developed along conventional lines by nine levels above and two levels below the elevation of the crusher.

cumulated on the stockpile, all except one of the mine shovels were assigned to waste stripping, and mill feed was loaded from the stock pile and hauled to the mill. The cost of this loading was added to the total truck operating cost, and no credit was taken for the tonnage hauled. The stock pile reduced the number of operating trucks and increased the overall truck and shovel efficiency.

The trucks deliver the ore to a hopper above the primary 48x60-in. jaw crusher. The average ore haul is about 0.8 mile or 1.6 miles a round trip. To date, most of the ore has been hauled downgrade. To facilitate downgrade hauling, six trucks were equipped with water-cooled brakes. The water-cooled brakes functioned excellently when they were new, but maintenance proved costly.

Waste Used as Fill

The waste is composed of stripping and low-grade material between the concentrations of ore. Waste was used for a highway fill across a swamp toward another of the company's ore bodies where exploratory core drilling was started in 1950.

The rest of the waste was hauled to various dumps. The average waste haul during 1948-1949 was approximately 1.25 miles, or 2.50 miles a round trip. As the ore and waste hauls average out to approximately one mile, the "cost per long ton hauled" is equal to the "cost per ton mile."

Below is a table giving a 7-year summary of the tonnage hauled by each of the company's 17 trucks. The average truck over a period of seven years (1942-1949) hauled 776,926 long tons of ore and waste in 16,403 hours of operation. Fourteen of these trucks were of 15-ton capacity and the remaining three, purchased in 1948, were 22-ton. These figures do not include production of two trucks purchased and later sold, or rental trucks. However, the latter contributed little to the total yardages hauled.

HAULING COSTS

Year	Total cost	Total long tons ore, waste	Cost, long ton, ore, and waste
1943	$100,109.58	1,168,685	$0.09
1944	154,546.84	1,272,442	0.12
1945	166,993.06	1,553,517	0.11
1946	143,446.15	1,634,281	0.09
1947	190,212.94	1,766,015	0.108
1948	355,166.67	3,064,018	0.1159
1949	271,035.47	3,115,314	0.0870

Over the same period, the cost of hauling ore to the mill and waste to the dump is shown in the table labeled Hauling Costs.

As will be noted from a study of these tables, the over-all cost of hauling ore and waste was considerably lower in 1949 than it was in 1948. Partly, the lower cost was due to lower truck maintenance costs which were reduced because fewer engines were overhauled in 1949 than in 1948. But mostly, it was due to hauling efficiency which was increased 20.3%. It was 52.7 tons per hour in 1948 and 63.4 tons per hour in 1949.

Here are a few of the factors contributing to the better record: Mine roads were maintained in better condition by using more crushed-stone road surfacing and employing a full-time road-grader operator. In the summer when the roads are dry and dusty a sprinkler truck operates full time.

Very little operating time was lost due to equipment repairs after the mine went to a 5-day week, Monday through Friday. All of the maintenance men and repairmen worked on Saturday. The labor turnover since the end of the war has been greatly reduced. As the truck drivers gained more experience, accidents were fewer and maintenance costs lower.

The policy of maintaining the trucks in excellent condition is reflected in the table below. The cost per ton for hauling has not increased with age. The four oldest 15-ton trucks, purchased in 1941, are compared with the four newest 15-ton trucks. Trucks 11 and 12 were purchased in December 1945, and trucks 13 and 14 were purchased in June, 1947.

Comparative costs, old and new trucks:

Trucks 1, 2, 3, 4—Total operating and repair cost without depreciation, $63,588.84; total long tons hauled, 568,806; cost per long ton hauled, $0.1118. Trucks 11, 12, 13, 14—Total operating and repair cost without depreciation, $85,674.15, total long tons hauled, 758,450; cost per long ton hauled, $0.1130.

Depreciation was deducted from these figures to keep the comparison on the same basis. The old trucks operated fewer hours and hauled fewer tons because they have manual steering. The drivers prefer the new trucks with hydraulic power steering.

TRUCK TONNAGE REPORT

Truck No.	Date purchased, mo.-day-yr.	Total ore & waste, long tons	Total hours operated
1	10-31-41	972,750	22,107.5
2	10-31-41	926,818	21,407.0
3	10-31-41	1,025,530	22,817.5
4	10-31-41	1,059,697	26,383.5
5	12-31-45	694,541	15,262.5
6	12-31-45	706,515	15,184.0
7	12- ?-42	1,097,550	25,103.0
8	12- ?-42	974,251	22,440.0
9	6-29-44	811,116	17,705.0
10	6-29-44	816,993	18,100.0
11	12- ?-45	694,848	15,357.0
12	12- ?-45	695,715	15,048.5
13	6-30-47	507,194	10,615.0
14	6-30-47	479,864	10,001.0
15	2- 9-48	586,662	7,096.0
16	2- 9-48	597,352	7,194.0
17	2- 9-48	605,356	7,428.0
		13,207,752	279,249.5

Tire Cost Important

The cost of truck tires is a major item in the total cost of hauling ore and waste. It is generally recognized that heavy-duty tires on ore trucks do not wear out but usually fail because of stone bruises that occur at the shovel or on the waste dump during the night shift. Bulldozers are kept near the shovels and waste dumps to clean the roads and keep them smooth.

The company builds good mine roads and maintains them in excellent condition with a motor grader and sprinkler truck. Tire chains are not used on the ore trucks. Calcium chlor-

● Rock is loaded to 22-ton ore truck by P & H electric shovel. National Lead Co. has found it important to maintain a correct balance between the primary crusher capacity, the number of shovels loading ore, and the number of trucks hauling ore. An ore stockpile helped cut waiting time at the crusher.

ide sprinkled on the ice and snow has proved effective.

It is important that tires be inflated to the exact pressure recommended by the manufacturer. In order to obtain maximum wear, the diameter of dual tires must be matched within ¼ inch. A new tire should never be installed with a used tire in a dual mount. To prevent rust, the rims are painted with a mixture of powdered graphite and brake fluid.

A steel plate, 0.75 inches in cross section and four feet in length is suspended from the truck frame between the dual tires. The plate will remove a rock before it becomes wedged between the dual tires.

Accidents have occurred when heavy-duty truck tires are inflated for the first time, because a lock rim may blow off and injure the tire-repair man. To prevent this type of accident, three safety chains are placed around the tire and rim before the initial inflation.

The garage mechanics work three shifts a day. The major repair jobs are done on the day shift. After the day shift in the mine, the fuel oil, lubricating oil, and water in each truck are checked. After the night shift, all the trucks are refueled. Air pressure in all tires is checked and is held within five pounds of that recommended by the tire manufacturer.

The trucks are given a regular, complete service every 60 to 80 operating hours. Each day the two trucks with the most operating hours are serviced as follows: (1) grease chassis, (2) change engine oil, (3) check air filter (during the summer the oil bath may have to be changed and the filter cleaned every week, but when snow is on the ground it is changed every two or three months); (4) add battery water as needed, (5) inspect for loose or missing bolts, (6) inspect lights, (7) test windshield wiper, (8) test brakes, (9) inspect truck frame, and (10) inspect truck body.

According to the maintenance superintendent, a good lubrication man is the most important employee on the job. He not only lubricates the truck but also finds the repair jobs that are needed before a breakdown occurs.

The diesel truck engines are overhauled or rebuilt when the bearings and pistons show excessive wear and use an excessive amount of lubricating oil. This occurs about every two years, or after 7,000 to 10,000 operating hours. Rebuilding a diesel truck engine costs about $2,000.

As a check on performance, all trucks are equipped with a tachograph including an automatic recording chart. This instrument helps conserve the truck life in several ways: (1) a signal light at the lower right-hand corner of the tachograph gives a warning to the driver that he is exceeding the specified rpm limit, (2) total revolutions of the engine for the entire day are recorded on the chart, (3) an accurate rpm of the motor at any time of the day is recorded on the chart. This record is made independently of the other data even if the drive cable should be broken or disconnected.

The National Lead Co. has demonstrated that not withstanding rising wages and higher prices generally, constant attention to the practice of more efficient haulage can result in low costs.

• Just below Grand Coulee Dam, Caterpillar D8 bulldozer moves huge rocks to water's edge, for protection against the boiling Columbia River.

• Rear-dump 20-yd. Euclid powered by General Motors twin six diesels dumps a couple of big ones for the top layer of the stream's coat of armor.

Columbia River Gets Coat of Armor

By W. J. Granberg

ARMOR plating the Columbia River just below Grand Coulee Dam with a coat of rock is a chore calling for rugged equipment to handle the huge boulders that weigh all the way from three to 30 tons. This job, being done by Morrison-Knudsen Co., Inc., of Boise, Idaho, at a contract price of $1,971,000, is designed to keep the river from eating away its banks.

The new, sloping granite walls of the stream extend for a distance of 3,500 feet on the west bank and for almost one mile on the east shore. Seventy-five to 100 feet wide, the walls consist of gravel, rock and boulders to a depth of five to 10 feet and are capable of protecting the banks from a once-in-a-century flood of 725,000 cfs. Gravel was placed to a depth of 2½ feet, followed by jagged riprap for about five feet, with a layer of huge boulders on top.

Approximately 750,000 tons of rock were blasted from a nearby quarry for the project. Each blast required 10,000 pounds of 40% dynamite tamped into 65 holes driven to a depth of 30 feet. Hauling of the rock to site of dumping was done by 10-wheel rear dump Euclids which have a capacity of 20 yards. They are powered with twin 6-cylinder General Motors diesel engines.

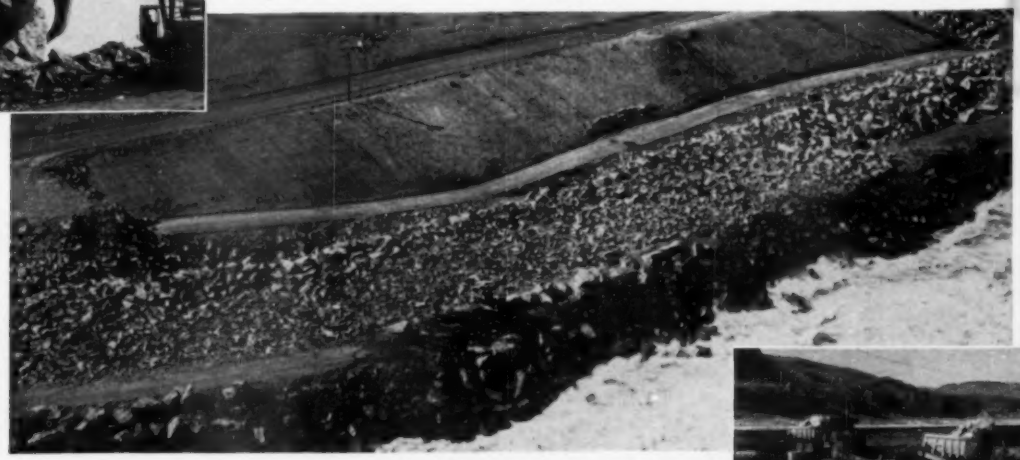
Much of the rock, about 250,000 tons of it, was ferried across the 600-ft. river in the Euclids which were carried on a barge operating on a 2-in. highline cable. Nearly 8,000 trips were made across the stream, with a payload of more than 45 tons each time. Each crossing took two minutes and one was made every 18 minutes in a working day.

While the trucks did the hauling, dumping the rock and boulders, a Manitowoc 500 Speedcrane placed the heavy stuff in proper position on the river banks. Minimum weights of the boulders were three to six tons, those in the 20-ton class were common, and many weighed more than 30 tons. The Manitowoc, powered with two 6-cylinder General Motors diesel engines, worked with a 90-ft. boom. Since the armor plating job could be done only at low water, work had to be rushed in the fall of the year to complete the chore before rains swelled the stream.

• Rock claw of Manitowoc 500 Speedcrane with 90-ft. boom lifts a 20-ton boulder into place.

• The new granite wall stretches for almost a mile below the dam and is capable of containing a flood of 725,000 cfs.

• Two Euclids complete one of the 8,000 trips made on this barge which carried a total of 350,000 tons of rock across the river.



Quebec Spans a Traffic

Cutting through 200,000 yards of rock and shale to build a new bridge on the Chaudiere River, and placing a new traffic deck on the 3,240-ft. St. Lawrence span, Quebec solves a traffic problem on the southwest side of the city.

by E. T. Nesbitt

QUEBEC Bridge, crossing the St. Lawrence River seven miles southwest of the old French-Canadian city, is getting a new look. Traffic increase along this section of the Trans-Canada highway (route 2) has necessitated construction of a 30-ft. wide raised road deck over the 3,240-ft. span, and a completely new steel highway bridge across the nearby Chaudiere River.

Dufresne Engineering Co. of Quebec has a 2½-year, $5 million contract for grading at both ends of Quebec Bridge, widening four cuts, building cloverleafs, foundations, overpasses, drainage sewers and retaining walls. This project, which will provide much needed improvements to that section of the Trans-Canada highway is being carried out under direction of The Department of Public Works.

To extend the north and south approaches straight north and south from the Quebec Bridge, it was necessary to widen the deep rock cuts at both ends of the main bridge. The cuts averaged 35 to 40 feet in depth and in one place on the south side nearly 85 feet. Heavy drilling operations were necessary.

A total of 85,000 yards of solid rock and 100,000 yards of red shale was excavated under Dufresne Engineering Company's contract, all of it under difficult operating conditions, due to frozen ground and close clearance between railroad tracks, overhead, main power lines and telegraph cables.

Extensively used on the heavy rock drilling were DA30 Ingersoll-Rand portable jackhammer drills, with detachable bits. Rods averaged six to 10 feet, with some running to 16 feet in length. Bits were from 1½ to 2⅜ inches and were discarded after about nine feet of drilling. Powering the drills were eight Ingersoll-Rand and Sullivan units of 315 cu. ft. capacity.

Removing the rock were two Bucyrus-Erie shovels and a fleet of 20 trucks. Six yard Internationals, 3-ton Macks, and other trucks with wood bodies moved the rock and soft shale.

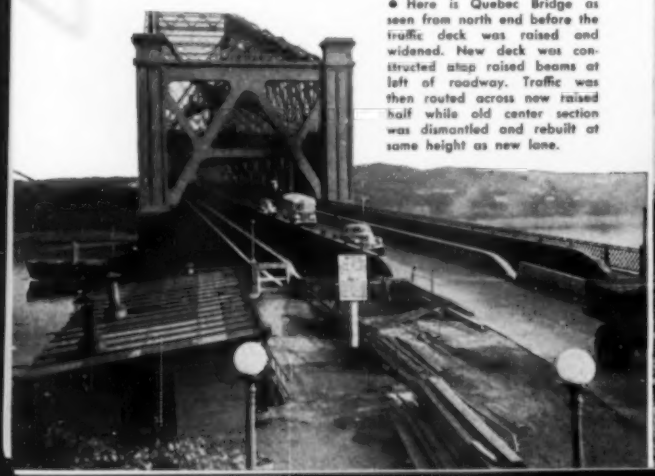
The Bucyrus-Erie shovels were a new 38-B, with 1½-yd. dipper, and a 50-B, an ancient steam powered model of 1927 vintage, equipped with a 2-yd. bucket, and operated by its constant companion for the past 23 years, Thomas Kemp, age 73, of Montreal. Kemp operated the old 50-B on excavating in that city about the year 1930.

Assisting these shovels was a Dominion 1½-yd. clamshell and handling the rock ballast was a Dominion 1-yd. clamshell. When working in shale, two Caterpillar D8 bulldozers and two Caterpillar D4 bulldozers operated in conjunction with a Caterpillar-drawn LeTourneau rooter to keep the shovels supplied with material.

The older machine, the 50-B, excavated a total of 65,000 yards of rock alone over a period of eight months during winter and early spring. Rock cuts were completed at the end of March, 1950.

Rock Fill on Approach Roads

All excavated rock was used for fill on both north and south approach roads. The haulage of the 5-ton trucks averaged about 150 yards per day



● Here is Quebec Bridge as seen from north end before the traffic deck was raised and widened. New deck was constructed atop raised beams at left of roadway. Traffic was then routed across new raised half while old center section was dismantled and rebuilt at same height as new lane.

Problem

each. The many smaller trucks, mostly with wooden bodies, used to haul the soft shale, averaged about 100 yards per day.

A great deal of hand labor was required on the grading of the long approach roads. An average force of 300 men worked under the Dufresne Engineering Company's contract, which covers the stretch from the Charny side of the Chaudiere Bridge, northward across the main Quebec Bridge to a point about one mile north of the St. Lawrence River.

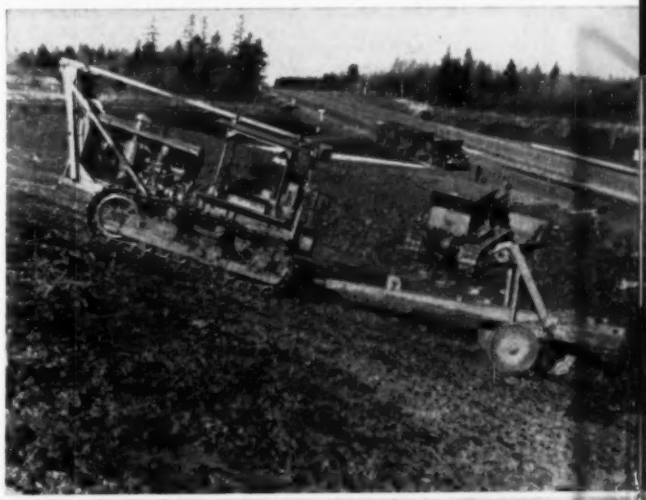
The contract included paving and grading of three miles of completely new road, averaging 50 feet in width, and with grades up to 45 feet in depth in some stretches; construction of three concrete overpasses, 4,500 feet of concrete sidewalk, installation of 2,000 feet of storm sewers, grading of cloverleaf curves, placing 4,000 tons of heavy rock ballast on steep grades of the railroad overpass abutments, construction of nearly 2,000 feet of concrete retaining walls on approaches to the main bridge and construction of the foundations for the Chaudiere Bridge.

Erect New Bridge

On the new approach from Charny, to the south of Quebec Bridge, a new high-level steel span has been erected across the Chaudiere River. Superstructure for the new bridge was undertaken by Dominion Bridge Co. on a $650,000 sub-contract from Dufresne Engineering Co. It is 780 feet long, with a 480-ft. clear span, a 33-ft. wide roadway and a sidewalk. Deck is 140 feet above the water at low tide. About 1,085 tons of steel were required.

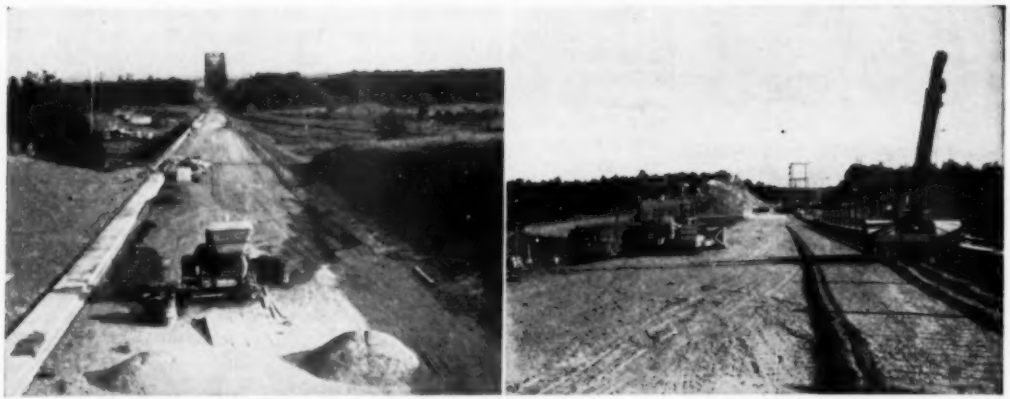
Foundation work for the Chaudiere Bridge presented a long and difficult job, but Dufresne Engineering Co. men completed this work in six months, starting in November, 1949. Concrete pier construction on the north side was fairly simple in spite of the steep incline of the 140-ft. solid rock cliff.

On the south side, however, two 60-



● Right: Shale that was frozen by rain and frost is broken by Caterpillar-drawn LeTourneau ripper. Cat dozer piles material for loading while haul trucks wait on new highway.

● Below: The old and the new — cutting through tough rock at both ends of Quebec Bridge is this team of Bucyrus-Eries. At left, a 23-year old veteran 50-B steam rig and right, a new 38-B operating at the north end of Quebec Bridge.



• Approach roads for Quebec Bridge. At left, road at north side of bridge was cut through shale and rock to a width of 45 feet. Blaw-Knox ¼-yd. mixer prepares sidewalk concrete. At right, Caterpillar D8 bulldozer grades viaduct roads.

ft. horizontal shafts of reinforced concrete had to be anchored seven feet into the cliff base and two 12-ft. vertical shafts constructed. These were sunk six feet deep to support the outer ends of the horizontal shafts on which the base of the bridge framework was to rest. The horizontal shaft girth was 6 x 8 feet and the vertical shaft 4 x 8 feet. Reinforcement was carried out with 1½-in. steel bars.

Falling rock was a constant hazard as the spring thaw started and heavy timber screens had to be erected above the excavating and concrete workers to protect them from serious injury, if not the risk of actual death. The worth of the screen was proved two days after it was erected when an avalanche of boulders suddenly descended, and bounced out of range of the foundation crew.

On this part of the job it was necessary to remove 3,000 cubic feet of rock and boulders by hand. It was physically impossible to put heavy equipment to work here because of the steep incline. The work of building the piers continued through the winter of 1949-50 and concrete was poured in late March. The steelwork started in early April. In all, 2,000 yards of concrete were poured for these foundations.

Dominion Bridge Co. used a steam winch and cable rig 100 feet high to hoist steel girders into position for the Chaudiere Bridge. The contract called for simultaneous erection from both sides, joining in the middle. A double eyebar, tieback rod system to hold each side of the bridge framework before it was joined in the center was used successfully and on Aug. 25, when the last girders were in position on both north and south sections, and falls on the tieback rods released, the sections slid perfectly into place and were riveted together in a matter of minutes. This called for congratulations all around, both for the good workmanship of Dufresne foundations men and Dominion Bridge steelworkers who staged a short impromptu celebration.

Construction of the concrete foundations for the bridge was started in November, 1949, steelwork started in April and it was ready for motor traffic by November, 1950.

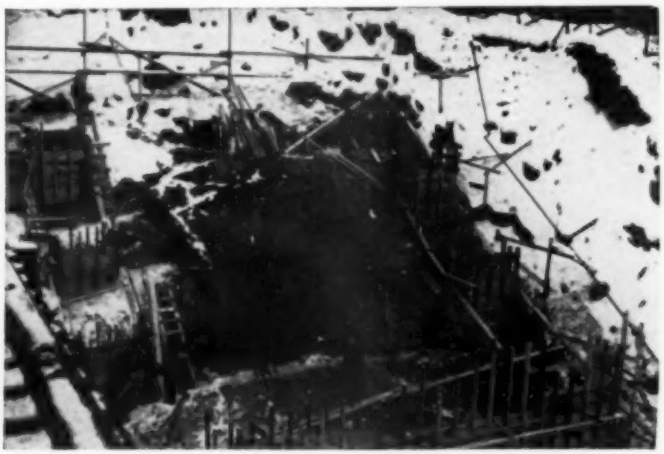
Improve Existing Span

The Dominion Bridge Co., Montreal, Quebec, also took the job of fabricating and erecting all steelwork and grid floor for the new roadway on Quebec Bridge on a $1,700,000 subcontract from the Dufresne Co.

Steelwork began when all rivets holding sidewalk brackets to the main east side girder were cut and temporary bolts inserted. These were quickly removed as 15-ft. lengths of concrete slabs were lifted to position by a hand operated hoist. Holes were then drilled in the raised sidewalk brackets.

Then a 6-in. channel beam was welded in an inverted position along the top of the main longitudinal girder at the west side of the east lane, to clear the lines of protruding rivets. Temporary fence brackets were welded at 15-ft. intervals along the same girder to support a traffic barrier.

Two lines of steel bars, 1½ inches square, were welded along the entire



• Foundation work for concrete legs to hold new Chaudiere Bridge necessitated drilling and excavating 6 feet into solid rock on 125-ft. cliff.

• New overpass was erected at St. Louis road crossing on north approach road because of heavy cross traffic.

length of the main longitudinal girder on the east side of the east lane. These bars and the channel beams held the ends of the deck grid sections flat and rigid. Deck frames were then placed on each cross girder and welded in position, to hold the double line of 14-in. longitudinal deck support girders (40-ft. I beams) on which deck grids would rest.

Lay 150 Feet Per Day

Next came the riveting of the beams to the tops of the 3½-ft. frames, and finally, the placing and welding of the steel deck grids on each side at four points of contact. Deck construction proceeded at the rate of 150 feet per day.

While erecting the wider deck, traffic had to be maintained on the old narrow center lane until the new east lane deck was finished. Dominion Bridge Co. crews, working from both ends, were forced to operate under difficult condition. The 150-ft height above the St. Lawrence River at which the welders and steelworkers placed the new framework, partly in slippery winter weather, was another hazard, but the project was completed without incident.

Steel beams were made in England and supplied by Eastern Canada Steel Co. The road deck grids, measuring 15 feet in length, 3 feet 8½ inches wide and 3 inches thick were supplied by Dominion Bridge Co. A total of 2,345 tons of steel was used. The deck extends the entire length of the main bridge framework and approach roads run to the new level at both ends.

Grids were filled with cement and paved with a 1¼-in. covering of asphalt. As soon as the east lane was completed, traffic was shifted, and Dufresne crews began ripping up the old reinforced concrete roadway.

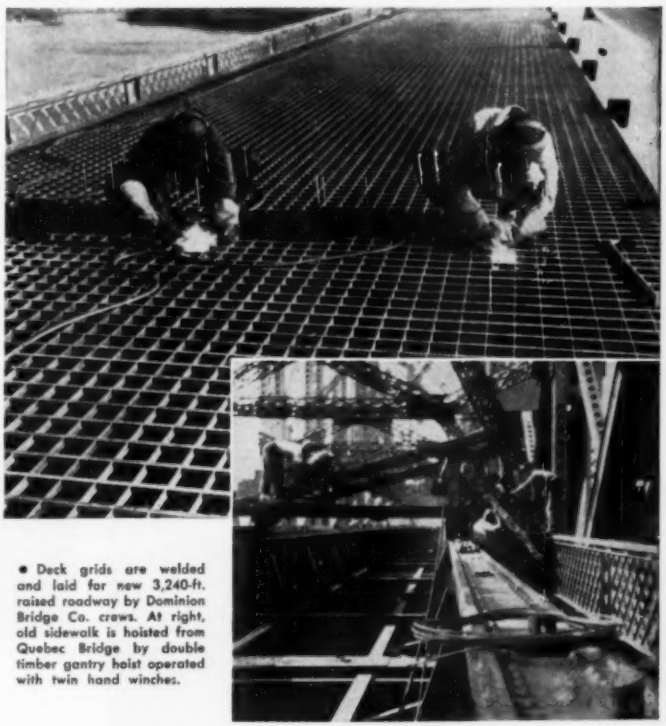
This pavement was laid on a continuous base of corrugated iron sheeting, a form of construction used to eliminate wooden forms and scaffolding underneath the roadway when it was built some 30 years ago.

It took 1½ months of tedious hand labor with paving breakers and acetylene torches to cut up reinforcing steel and corrugated iron. The concrete roadway was cut across in 6 x 15-ft. strips and lifted square on trucks by short boom cranes.

The entire road widening project on the main bridge is expected to wind up in summer of this year, along with the paving of the long approach roads on both sides of the St. Lawrence River. On the south side a new 4½-mile stretch of highway will connect the Levis bypass boulevard from Beaumont and Charny to the main bridge.

The road deck steelwork job was started in July, 1950. It is proceeding at the rate of about 150 lineal feet per day, but has many times exceeded this rate. Bad weather and delays in de-

Continued on page 41



• Deck grids are welded and laid for new 3,240-ft. raised roadway by Dominion Bridge Co. crews. At right, old sidewalk is hoisted from Quebec Bridge by double timber gantry hoist operated with twin hand winches.

• Steam rig sinks H-piles during early stage work on site of new 16-structure neuropsychiatric hospital in southeast Pittsburgh.

• Left: A 1½-yd. Bucyrus-Erie 38-B dragline places fill around completed foundation.

Pittsburgh's New 16-Building VA Hospital

Atop one of Pittsburgh's many hills, a big new hospital is rising for the Veterans Administration. James McHugh Construction Co., Chicago, has the $20 million job well under way.

HOSPITAL CONTRACTORS
JAMES McHUGH SONS, Inc.
CHAS. H. TOMPKINS Co.
JOHNSON DRAKE & PIPER, Inc.
B. PERINI & SONS, Inc.
PETER KIEWIT SONS' Co.

• Left: This hill overlooking the Allegheny River served as pasture for a dairy herd until recently. To level its top for the hospital construction, 1,400,000 yards of dirt and rock were moved. Note incline sewer trench in left foreground.

• Key men at work on the $20 million VA project: (left to right) R. L. Senior, project manager; James McHugh, Jr., building superintendent; Charles T. Lyons, excavation superintendent; and Ralph Patt, resident engineer, Corps of Engineers, U. S. Army.

IN southeast Pittsburgh, an organization of contractors known as Hospital Constructors has reached the half-way point on the job of building a new $20 million neuropsychiatric hospital for the Veterans Administration. The 1,000-bed 16-building institution is going up on a 250-acre site overlooking the Allegheny River.

Two prime contracts have brought the project along as far as it is. The first of these awarded to Ralph Myers Contracting Corp., Salem, Ind., for leveling the site to general grade. With a bid of $850,000, the Myers firm undertook to cut down an 84-ft. knoll on the 600-ft. hill which used to be the old Hartman dairy farm.

Cut Off Hilltop

To transform the grassy knoll into a level 250-acre bench, Myers moved 1,400,000 yards in 12-ft. lifts. Thirty per cent of the total yardage was composed of shale and rock. Contours of solid rock were blasted, then dug out with three shovels. A 2½-yd. 80D Northwest and two 2½-yd. Bucyrus-Erie 54-B's loaded the material to a

Continued on page 36

• Foundation excavation cut is made by Northwest hoe belonging to James McHugh Construction Co.

• Utilities trench is put through rock vein with air tools and hand shovel. Larger rock cuts were blasted and machine-dug.

News from the Field

Blast Pathway for Water

Contractors building the canal system of the Columbia Basin Project in East Central Washington have rugged going sometimes. The Guy F. Atkinson Co., working in columnar basalt uses a Bucyrus-Erie 120-B dragline (see cover) with a 90-ft. boom and an oversize heavy duty bucket to muck out the first section of the Potholes East Canal. Holes are drilled 24 feet deep on a 9x10-ft. pattern. They are loaded with Free Flow No. 5 and special 40% dynamite supplied by the Columbia Powder Co. In some cases, delays are used in the outside holes along the canal banks. Fragmentation is good with only a small amount of plugging and shooting required on big stuff. On the approach channel for the canal and headworks at O'Sullivan Dam, Scheumann and Johnson Co. is drilling ninety 20-ft. holes per round on a 9x9-ft. pattern. Holes are loaded straight with 1,750 pounds of 40% dynamite supplied by the Pacific Powder Co. Fragmentation is excellent with virtually no overbreak.

• Scheumann and Johnson use 1,750 pounds of 40% dynamite excavating for a canal on the Columbia Basin Project. Road in foreground indicates size of blast.

A.G.C. Presents 88 Awards For Accident Prevention

Eighty-eight awards for especially meritorious work in accident prevention in the construction field were presented to firms, chapters and branches at the 32nd annual convention of The Associated General Contractors of America in Boston.

The presentations climaxed a record year for the A.G.C. Accident Prevention Contest for the period ending September 30, 1950, which saw an increase of 69% in the number of firms that finished out the contest year. Awards to firms with the best 10-year records and to a chapter or branch secretary or manager for effective promotion of accident prevention, introduced in 1950, were continued this year.

• Officially opened on January 18, 1951, Brazil's first major Road Show was scheduled to last from 30 to 40 days. Situated beside Rio de Janeiro's Guanabara Bay, the show put on display the construction equipment handled by 30 leading agents.

Chapter Awards

The winning A.G.C. chapters were divided into two groups of three each. One contained chapters with more than 35 members; the other, those with 10 to 35 members. In the larger chapter classification, the winner, the Houston Chapter, Houston, Texas, with 86 members, had 52 or 60.5% participating. Second was the Pennsylvania Builders Chapter, last year's winner, with 44 members and 15 or 34.1% participating. Third was the Constructors Association of Western Pennsylvania, runner-up last year, with 65 members and 17 or 26.2% participating.

Two entries tied for first place with perfect records in the smaller chapter classification: the Dallas Chapter, with 31 members and 31 participating for 100%, and the Milwaukee Chapter with 26 members and 26 participating, also 100%. Second place went to the Detroit Chapter with 33 members and 20 participating for 60.6%, just nosing out the Chattanooga Chapter which took third place with 15 members and 9 participating for a percentage of 60.

Above Average Exposure

These awards are for the year ending September 30, 1950, in the class with over-average exposure:

Building Division (Average Exposure 216,771 man-hours): Madsen Construction Co., Minneapolis, Minn., first, with severity and frequency rates of zero-zero; Cleveland Construction Co., Cleveland, Ohio, second; and Bryant & Detweiler, Detroit, Mich., third.

Highway Division (Average Exposure 209,315 man-hours): Koss Construction Co., Des Moines, Iowa, first; J. E. Haddock Ltd., Pasadena, Calif., second; and Burrell Construction & Supply Co., New Kensington, Pa., third.

Heavy Division (Average Exposure 857,565 man-hours): Dravo Corp., Pittsburgh, Pa., first; T. L. James & Co., Inc., Ruston, La., second; and Maxon Construction Co., Inc., Dayton, Ohio, third.

Below Average Exposure

The awards in the group with under the average exposure of 216,771 man-hours are as follows:

Building Division: Fretz Construction Co., Houston, first, and Woermann Construction Co., St. Louis, Mo., second, both with severity and frequency

rates of 0.00; and E. J. Cross Co., Worcester, Mass., third.

Highway Division: J. D. Armstrong Co., Inc., Ames, Iowa, first, and R. B. Burch, Inc., Cedar Rapids, Iowa, second, both with severity and frequency rates of 0.00; and E. M. Duesenberg, Inc., Clear Lake, Iowa, third.

Heavy Division: C. F. Lytle & Amis Construction Co., Cambridge, Nebr., first, and Jutton-Kelly Co., Dearborn, Mich., second, both with severity and frequency rates of 0.00, and J. E. Haddock, Ltd., Pasadena, Calif., third. (The Haddock Co. also placed second in the highway above-average class.)

Five-Year Records

Best five-year records, covering the period from October 1, 1945 to September 30, 1950, included these awards:

Building Division, above the average exposure of 3,089,017. man-hours' exposure, first place was won by Newbery Electric Corp., Los Angeles, Calif.; Southeastern Construction Co., Charlotte, N. C., second; and J. A. Utley Co., Detroit, Mich., third.

In the five-year building class, under the average exposure, first place went to Martin L. Bauer Construction Co., Middletown, Ohio; with severity and frequency 0.00; second, Woermann Construction Co., St. Louis, Mo.; and third, A. L. Jackson Co., Chicago, Ill.

Over the five-year period in the Highway Division, first is George K. Werner & Son, Clay Center, Nebr., severity and frequency 0.00; second, Burrell Construction and Supply Co., New Kensington, Pa.; and third, Daniel F. MacNamee & Co., Inc., New Rochelle, N. Y.

The five-year record in the heavy division was established by Herbert F. Darling, Williamsville, N. Y. Second is E. E. Barber Construction Co., Fort Smith, Ark.; and third, The Fluor Corp., Ltd., Los Angeles, Calif.

10-Year Records

Best 10-year records, covering the period from October 1, 1940 to September 30, 1950, included these awards:

Building Division: first, H. B. Alexander & Son, Inc., Harrisburg, Pa.; second, H. P. Cummings Construction Co., Ware, Mass.; and third, E. J. Cross Co., Worcester, Mass.

Heavy Division: Maxon Construction Co., Inc., Dayton, Ohio, first; Holmes Construction Co., Wooster, Ohio, second; and Dravo Corp., Pittsburgh, third.

In the highway division there were no eligibles for the 10-year award.

44 No Lost Time Records

There were 32 firms in the building division receiving awards for reporting no lost time accidents during the year. They are Dow Construction Co., Houston, Texas; A. Drescher Co., Milwaukee, Wis.; C. A. Faux Construction Co., Houston; Siderito Construction Co., Milwaukee; Logan P. Marshall, Houston; Construction & Maintenance Co. of Texas, Houston; J. Lawrence Jones, Dallas; Burton & Clithero, Houston; Albert Myerson Co., Houston; Meers Construction Co., Dallas; James A. Roberts, Houston; W. H. Wallace Construction Co., Dallas; Berretta Construction Co., Exeter, Pa.; Frank H. Lee & Co., West Memphis, Ark.; Riha Construction Co., San Diego; Robert L. Reisinger & Co., Milwaukee; Jensen Construction Co., Minneapolis; Felix A. Davis Construction Co., Houston; Stack Construction Co., Milwaukee; R. J. Hortie, San Diego; Stibbard Construction Co., Detroit; Ramsdell Construction Co., Dallas; Martin L. Bauer Construction Co., Middletown, Ohio; Upton-Lang Co., Erie; Howard Construction Co., Houston; Trepinski Inc., Milwaukee; W. J. C. Kaufmann Co., Detroit; John C. Westphal Co., Detroit; I. C. Audish Construction Co., Houston; Robert E. Nesmith, Inc., Houston; Arch Munn & Sons, Dallas; and Viggo M. Jensen, Albert Lea, Minn.

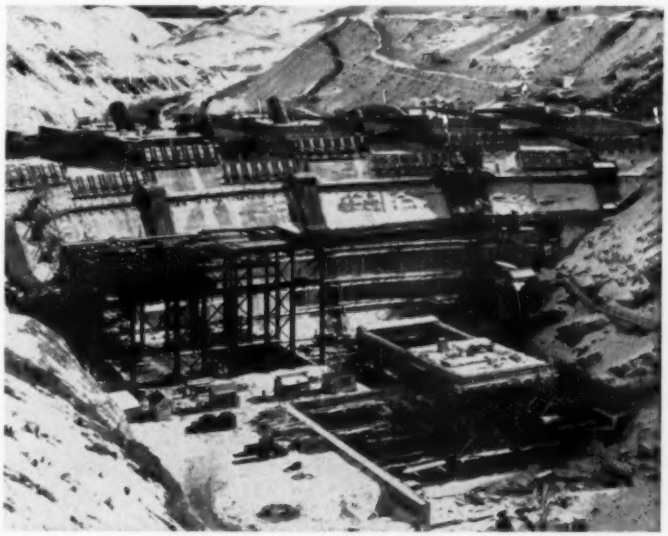
Eight firms in the highway division reported no lost time accidents: Gee Construction Co., Shenandoah, Iowa; J. T. Ryan, Oelwein, Iowa; Dixon Brothers, Correctionville, Iowa; Kehe Construction Co., Waverly, Iowa; Beaver Asphalt Paving and Construction Co., New Brighton, Pa.; The O'Neill Construction Co., Havre, Mont.; Mott Construction Co., Centerville, Iowa; and George K. Werner & Son, Clay Center, Nebr.

Four firms in the heavy division reported no lost time accidents during the year: Freeland Construction Co., Pittsburgh, Pa.; Henry L. Horn, Caldwell, Idaho; L. Walker Fauber, Ashland, Ohio; and George Carlson Co., Milwaukee, Wis.

Bury Canal Lining

A lining of buried asphalt membrane is helping to solve the problem of lining canals and laterals at a reasonable cost. The membrane is placed directly on the subgrade — the only preparation necessary is smoothing the bottom and sides of the canal — and covered with enough earth to hold it in place, protect it from livestock and reduce weathering. This lining can be constructed in practically any kind of weather. Cost is about 70c a square yard, including subgrade preparation.

Construction methods are simple. To allow space for the cover material, the canal is first overexcavated by dragline to a depth of one foot. If conditions are severe and greater cover depth is required to protect the membrane, the dragline excavates to a depth of two



• With snow and ice still blanketing Hungry Horse Dam in northwestern Montana, General-Shea-Morrison, prime contractor for the big multiple-purpose dam and power plant, was getting ready for a record-breaking construction year. Major work scheduled this year includes placement of approximately 1,200,000 yards of concrete and construction of the 285,000-kw powerhouse. Installation of the plant's four 105,000-hp turbines will be started this spring under a new contract which will also cover completion of the dam, powerhouse and switchyard.

• Three hand sprays facilitate the placing of membrane lining.

• Link-Belt dragline places 1-ft. earth cover over newly-sprayed asphalt membrane lining.

• International tractor with Bucyrus-Erie winch teams with semi-truck to roll subgrade prior to application of asphalt.

feet. Side slopes are also flattened to 1¾:1 or 2:1, in order to keep the cover soil in place later. The removed soil is stockpiled on the berm (or top of the canal bank) so that it will be ready when needed for replacement as cover. After excavation, the surface is generally rough, but a smooth surface is required to obtain a tight, uniform membrane. This is obtained by first dragging, and then lightly rolling the subgrade. Only a few trips by each piece of equipment are needed.

At the refinery, generally located within a few hundred mile radius of the job, the asphalt (heated to a temperature of 400° F.) is loaded in insulated railroad tank cars holding 10,000 gallons, or in insulated truck transports carrying from 2,500 to 5,000 gallons. If the haul can be made within 24 hours, the material may frequently be used without reheating. However, if greater time is required, "boosters," resembling water boilers, except that asphalt is circulated instead of water, are used to bring the temperature back to its original 400°. The asphalt is then pumped into truck tanks equipped with pumps and pressure lines, called "distributors." From these distributors, asphalt is forced through flexible metallic hoses and spray bars, and applied directly to the soil subgrade.

It takes from 1.25 to 1.75 gallons to form a square yard of asphalt membrane from three-sixteenths to three-eighths of an inch thick. The asphalt cools rapidly and the required thickness can generally be obtained by one application. Recently, spray bars attached directly to the distributors have been used. With this equipment, the distributor can travel in the canal bottom or on the berm and spray asphalt in a wide swath up to 20 feet or more. Although the spray bar usually has to make two or three trips over the area, the asphalt can be applied very rapidly and evenly. This method is a considerable improvement over hand-spraying.

As soon as the asphalt has cooled, it may be covered by using the dragline to scoop the soil from the berm directly on the membrane until the required depth of cover, allowing for settlement, is obtained. Then the surface is smoothed by dragging, and the canal is ready for use. If the canal is subject to erosion, it's a good idea to cover the soil with a gravel blanket four inches to a foot deep, depending on the erosion situation. The cover soil is not compacted but allowed to settle during use.

Construction Equipment Outlook for 1951

Speaking before the Associated General Contractors Convention in Boston, Ralph K. Stiles, President of the Construction Industry Manufacturers Association, gave a forecast regarding "The Outlook for Construction Equipment." He presented a summary of the probable availability of a number of different types of construction machines during 1951. His statements were based upon opinions he received from prominent equipment manufacturers. The following are the statements of the company representatives as they were relayed to the A.G.C. members by Mr. Stiles:

Motor Graders

Our industry produces an average of about 8,000 motor graders of all sizes per year. It is estimated that the military may require about 6,000 this year and perhaps 3,500 to 4,000 per year afterward. Depending upon the amount of steel and components allocated, there should be a sizable number for civilian needs—but far under the level of 1950.

Contractors' Pumps

At the present time, the industry is booking an unusually large number of orders for drainage pumps used in the construction industry. This volume results from the large number of heavy construction operations recently awarded; their extensive foundation structures require dewatering pumps in large numbers. We are carrying the largest backlog of pump orders in our history and we anticipate a continued heavy demand throughout 1951.

Loaders

Loader availability for essential construction as we see it at the present time should be fairly reasonable in 1951. Most loader companies report their product is being supplied for construction and industry. Naturally, receipt of raw materials and components by the loader manufacturers will definitely govern availability of the completed products. Application and use of loaders in construction had been on the increase for many months prior to Korea or July, 1950. Production schedules of many loader companies on the front-end mounted type of both rubber and tracks as well as bucket and conveyor types have been doubled in the past year.

Roller and Compactors

The principal problem confronting the manufacturers of rollers and compactors is that of securing steel and

other scarce materials used in producing the finished product. This is especially true in attempting to supply equipment for civilian use. All manufacturers have more civilian orders on their books for machines than they can possibly secure materials to build. It is reasonable to assume that the roller and compactor industry could supply military needs with 50% of its productive capacity, thereby leaving 50% of the output for civilian use. These percentage figures are based upon the recent military purchasing record and our knowledge of their anticipated requirements for this calendar year.

Tractors

There is every indication that the current heavy demand for crawler tractors by civilian users will continue. The armed forces are buying the three largest models in sizable quantities and, since this business must be given shipping preference over orders that do not carry priority ratings, manufacturers will be hard-pressed to supply their normal customers. On the other hand, it is expected the essentiality of tractors will ultimately be recognized by the government and that manufacturers will be allowed to produce at capacity. This should make available to civilians well over half the industry's output of crawler tractors.

Scrapers

The scraper and hauling industry has already received military and priority orders of rather staggering proportions, and many more orders are expected in the immediate future. The small proportion of these units available for civilian requirements will, in all probability, be directed to those operations which are related to the defense program, such as iron ore, copper, bauxite, etc. The overall supply problem actually is aggravated by the inability of manufacturers to secure raw materials, such as plate and structural stock. Production capacity is not the basic problem; more units could be produced if more materials could be made available.

Power Cranes and Shovels

After making allowances for known and estimated military requirements, as well as export shipments, and assuming that first, the power crane and shovel industry during the year 1951 can steadily increase its overall output until it reaches 100% capacity by receiving an ever-increasing amount of materials and components, which means that during the third quarter of this year the amount of such materials and components must be approximately 60% higher than what the industry received during 1950; and second, the supply of materials and components is assured under priorities extended by private purchasers; it is estimated that there will be available for delivery to domestic users, other than U. S. government agencies, power cranes and shovels in sizes ranging from ⅜ to 2½-yd. capacity inclusive, including rubber tired equipment, between 4,000 and 5,000 units during the year 1951, and the same amount during the year 1952. This compares with deliveries to domestic users, other than U. S. government agencies, during the year 1950 of between 5,500 and 6,000 units. With reference to power cranes and shovels larger than 2½-yd. capacity, it can be expected that they will be available in ever-increasing amounts as compared with what was available in 1950, with production eventually reaching a point approximately 30 to 50% above the output for 1950.

Rubber

The entire rubber program has been taken over by the government, and it is no secret that the production of synthetic has not been coming in as planned, and was considerably lower than expected in January and will so continue through February. Increases are projected for March and April, with full production by the middle of the year. The main reasons for the delay are: 1) Slowness in getting the program started; 2) Diversion of synthetic rubber "feed stocks" to aviation gas; 3) Lack of immediately available trained personnel, and 4) Unforeseen difficulty in reconditioning plants and equipment because of the long shutdown.

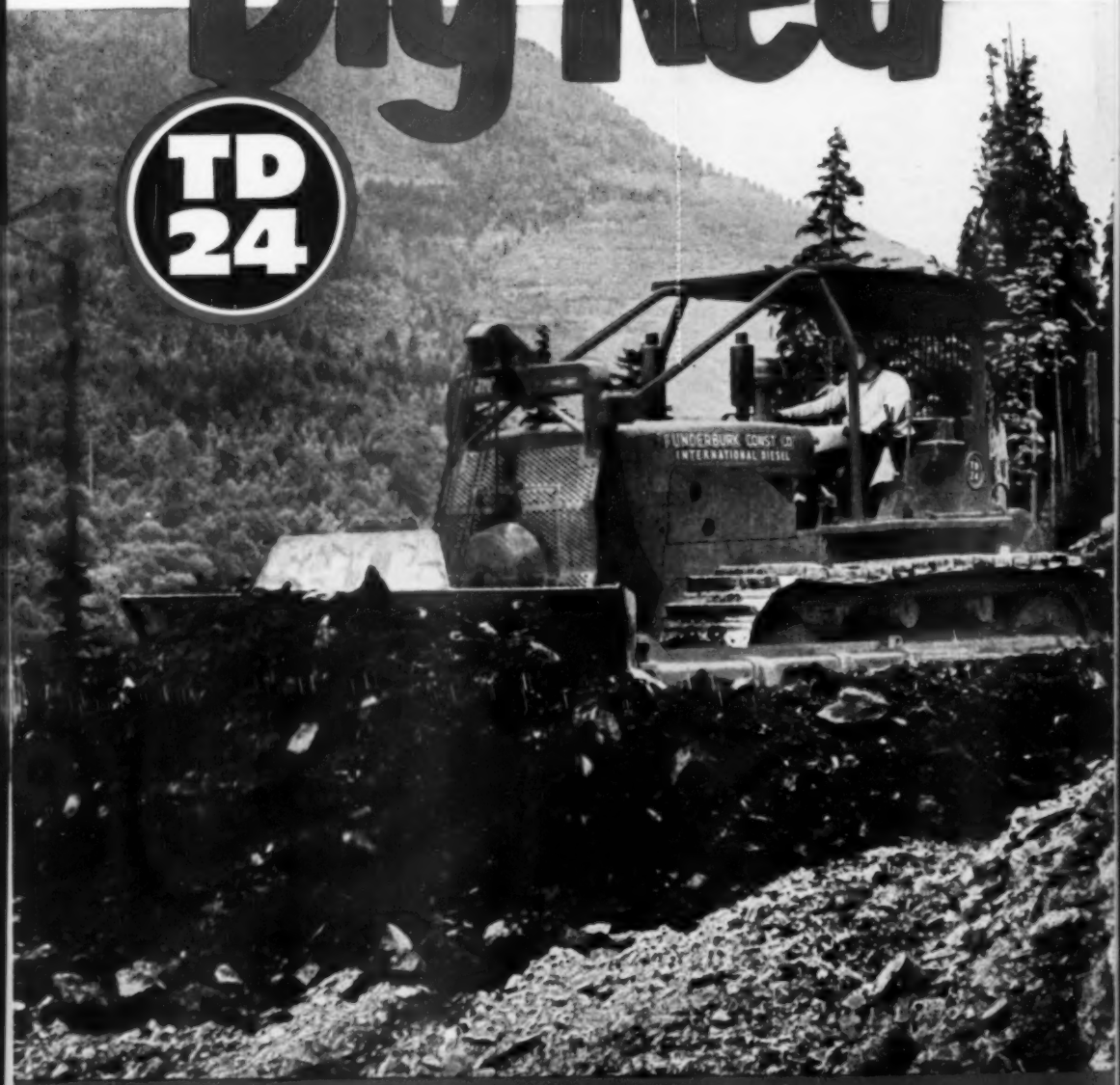
As for vegetable or natural rubber —our government restricted the use of natural rubber and allocated the scheduled production of synthetic rubber. Unfortunately, all the synthetic rubber allocated has not been available, which means the tire industry has been unable to make tires which government regulations permitted. While at present the rubber industry faces an uncomfortable situation, the future looks bright, indeed. By the middle of March, all synthetic rubber plants in the United States should be in operation, with a total capacity of one million long tons of rubber annually. In 1950, the rubber industry imported approximately 720,000 long tons of natural rubber. The government tempo

Continued on page 34

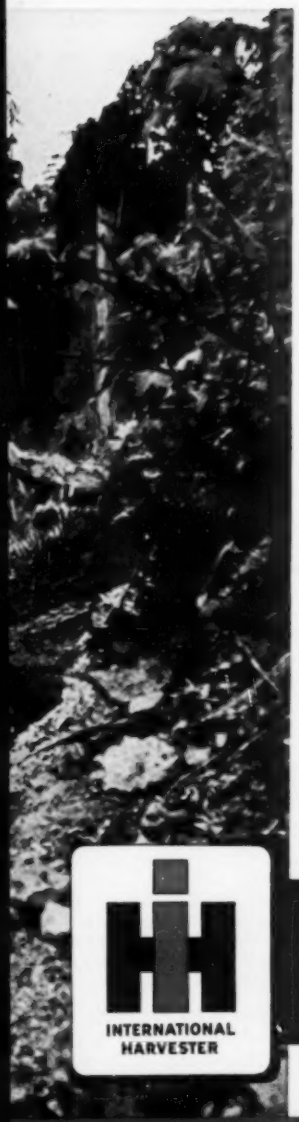
● In the state of Michoacan an International TD-18 mounted Bucyrus-Erie Bullgrader works on a bridge that will be the longest single span in Mexico. In the mountainous region leading to the lowlands of Apatzingan the Commission of Tepalcatepec is building bridges, dams, roads, schools, citrus factories and medical centers.

"Big Red"

TD 24



Beats Blue Mountain



Read how the International TD-24 pays off, helping build mountain-top radio station.

Out near Seattle rise two 3,000-foot peaks that have suddenly become mighty important. Blue Mountain and Wheeler Mountain, a mile apart, are the bases for new antenna towers of what will be one of the most powerful radio stations ever built.

Toughest part of the construction job was building roads up the mountains. First the Funderburk Construction Company conquered Mt. Wheeler. Then they bought a new International TD-24 and started gouging out the rocky road to the top of Blue Mountain. And with the big red champ on the job, they moved faster, easier, more profitably.

"It's the TD-24's power and Planet Power steering that pay off," says Ed Funderburk. "The TD-24 stays up in the bank easier and pushes bigger bladefuls farther than any other tractor can. This means lots more material moved at the end of the day."

It means more work done on any job. See for yourself. See your International Industrial Distributor and get the real low-down on the TD-24. And check up on the service your distributor can give you over the hard-working years ahead. With factory-trained mechanics and ample shop facilities, backed up by International's strategic network of parts depots across the country, your International Industrial Distributor is all set to keep your International power on the job for you and the nation!

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

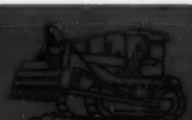
TOP THIS ONE! Building a 14-mile road to "top" Blue Mountain means dozing down 250,000 cubic yards of material—mostly rock. It's a job that calls for the brute power of the world's most powerful crawler—the International TD-24.

RECESS FOR THE CHAMP! It's child's play for Ed Funderburk's TD-24 when the skinner lays off dozing long enough to pull stumps from the new road's right-of-way.

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS



News

Continued from page 31

in the importation of natural rubber this year is considered favorably higher than the 1950 rate. So, for stockpiling, plus civilian and defense requirements, the industry should have more than adequacy in raw materials by the middle of the year.

Off-Highway Trucks and Trailers

At a conservative estimate, this industry now has capacity to handle fully three times the maximum volume attained during the years of World War II. In the present outlook for 1951 it does *not* appear that direct military procurement of "Off-Highway Trucks and Trailers" will be a major factor. A fair estimate would be perhaps 10 to 15% of total production. There will be another important factor, perhaps taking as much as 20%. This is in the field of military operations performed by civilian constructors. The remaining 65% available for industry and civil construction, should represent a volume of machinery comparable to normal years, provided maximum manufacturing facilities can be utilized, with sufficient materials and component parts made available for such utilization.

Materials Handling Meet in Chicago

Fifty-eight of the nation's top experts on materials handling will conduct the most extensive effort to educate industrial leaders in new handling techniques at the Conference on Materials Handling which will be held concurrently with the National Materials Handling Exposition at the International Amphitheatre, Chicago, April 30-May 4, inclusive.

Thousands of new models of handling machines of more than 200 companies will be on display in ten acres of exhibit space, six indoors and four outdoors. The exposition is one of the five largest industrial shows in the country. The conference sessions accompanied by exhibits of machines in use will bring together under one roof virtually every aspect of materials handling. Visitors from every state, Canada and scores of foreign countries are expected.

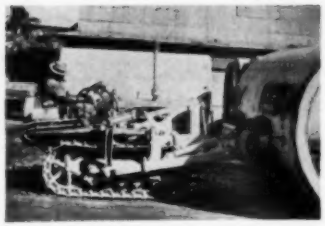
Sooners Rebuild US 66

The biggest face lifting job ever attempted in Oklahoma on one highway at one time is in progress on US 66, the Broadway of America. A compilation of projects now in construction on the 356-mile route totals $9,265,000 in contracts.

The greater part of improvements being made are along the route where it enters the northeast part of the state down to Yukon, a distance of 217 miles. This will widen the 18-ft. county built paving and 18-ft. county built bridges and eliminate many curves.

The narrow roadway is being widened and resurfaced to 24 feet. Weary bridges are coming out and standard designed structures are being substituted.

Crooked roadway is being abandoned for new location, and at one spot in Creek County five miles of new location eliminates 23 curves, the curviest section of the road in the state. Where traffic is heaviest four-lanes are being built.



• Pipe sections as big as 84 inches in diameter and weighing 21 tons are shoved about by a unique pushing arrangement which consists of hard rubber rollers applied to a bulldozer blade. The Hawaiian Dredging Co., Honolulu, is using this machine on the San Island sewer outfall job. It uses a Caterpillar D2 tractor with the roller device to push the heavy concrete pipe sections to the wharf where they are loaded aboard a small barge to be towed out to the dredging site.

Heavy Equipment on Display at British Fair

The most comprehensive display of working construction equipment ever organized in Britain will be included in the British Industries Fair this spring. One hundred seven exhibitors will have 147,000 square feet of space in this outdoor show scheduled for Birmingham, England, from April 30 to May 11.

The exhibit will be held outdoors so that construction equipment can be displayed. Shovels and cranes will demonstrate features under actual working conditions. The Federation of Manufacturers of Contractors' Plant is organizing this part of the fair.

Army Plans 210 Projects

The Corps of Engineers has listed military construction projects for the Army and the Air Force to be undertaken during the current fiscal year. The listing totals 210 projects in 24 states, the District of Columbia, Alaska, Bermuda, Hawaii and Okinawa, to cost $209 million.

only a 1 MAN JOB

DIGGING OR STOCKPILING WITH A

SAUERMAN POWER DRAG SCRAPER

Movement of almost any kind of material can be accomplished economically by a Sauerman Scraper. It is used to excavate sand, gravel, clay, etc., and deliver to hopper or pile. It is used to clean out sludge basins and handle all kinds of viscous materials. It is used for stockpiling coal, ore and other bulk materials. Wherever used it saves time, money and manpower.

One easily trained man controls the operation and takes care of the small amount of maintenance. Only a few parts come in contact with the material being worked, so wear is slight. Installation cost is low and power consumption, Diesel, gasoline or electricity, is small on the basis of tonnage handled.

STORY BEHIND THE PICTURE

A 50-year accumulation of waste coal silt at a Pennsylvania mine is being reclaimed by a 3 cu. yd. Sauerman Power Scraper to a processing plant where the waste is converted into usable fuel. The above photo shows the scraper making its first cut into the pile, which is 1,900' long, 700' wide and 50' high.

★

Write for the Sauerman Catalogs A and E and read the facts about handling materials with power scrapers.

SAUERMAN BROS., Inc.

574 S. Clinton St., Chicago 7, Illinois

You SEE the saving!

Above: EASTON BD hydraulic drop door truck bodies for rugged, versatile duty on earth, rock and ore moving jobs.

•

Below: EASTON TP pan type side-dump trailers for big payloads at low cost in shovel-to-crusher hauling.

•

Investigate these and other EASTON side-dumps. Capacities are limited only by the truck chassis of your choice.

Watch that smooth side-dump action!

You *roll up, dump* and *roll on!* Side-dumping cuts out needless backing and turning. You can see the saving in time, money, effort!

B-1046

Get the facts straight from headquarters — from EASTON side-dump engineers!

EASTON

Side-Dumps

Easton Car & Construction Company, Easton, Pa. • Headquarters for Side-Dump Cars, Truck Bodies and Trailers

VA Hospital

Continued from page 27

fleet of 28 bottom and rear dump Euclids. Tractor equipment moved dirt that was used as fill around the perimeter of the hill.

Eleven scrapers handled the bulk of this assignment. They included six LaPlant Choates, two 12-yd. LeTourneau pans and three Terra Cobras. Helping spread the fill were five D8 Caterpillar tractors with bulldozers and three Caterpillar motor graders.

Myers began shaving down the hilltop in April, 1949, and wound up work the following November.

With the top of the hill flattened, Hospital Constructors took over the major contract for the multi-million dollar institution. The name, Hospital Constructors, does not denote a company or corporation. It is simply "a name used for convenience to denote these joint venturers": James McHugh Construction Co., Chicago; Chas. H. Tompkins Co., Washington, D. C.; Johnson, Drake & Piper, Inc., Minneapolis; B. Perini & Sons, Inc., Framingham, Mass.; and Peter Kiewit Sons' Co., Omaha, Nebr. They selected James McHugh Construction Co. as sponsor to supervise and perform the work.

Provide Recreation

Completed, the neuropsychiatric hospital will consist of 16 buildings of varying heights and floor areas. Tallest structure will be the 6-story General Medical and Surgical Building, housing a 240-bed general hospital and two psychiatric wards. In addition, there will be two 4-story, nine 2-story and four 1-story structures. Not all will be medical buildings; there will be room for a gym, swimming pool, chapel, cafeteria, library and theater. All structures were designed by the Pittsburgh firm of Prack & Prack, Bowers and Barbalat, and Alfred Hopkins and Associates of New York City.

• Two Bucyrus-Erie 38-B cranes were handling all concrete bucket work. Largest of the buildings is this 6-story General Medical and Surgical Building.

• Below: Eight-foot wide by 10-ft. high concrete lined underground passage-ways like this will connect all main buildings.

Later Excavation

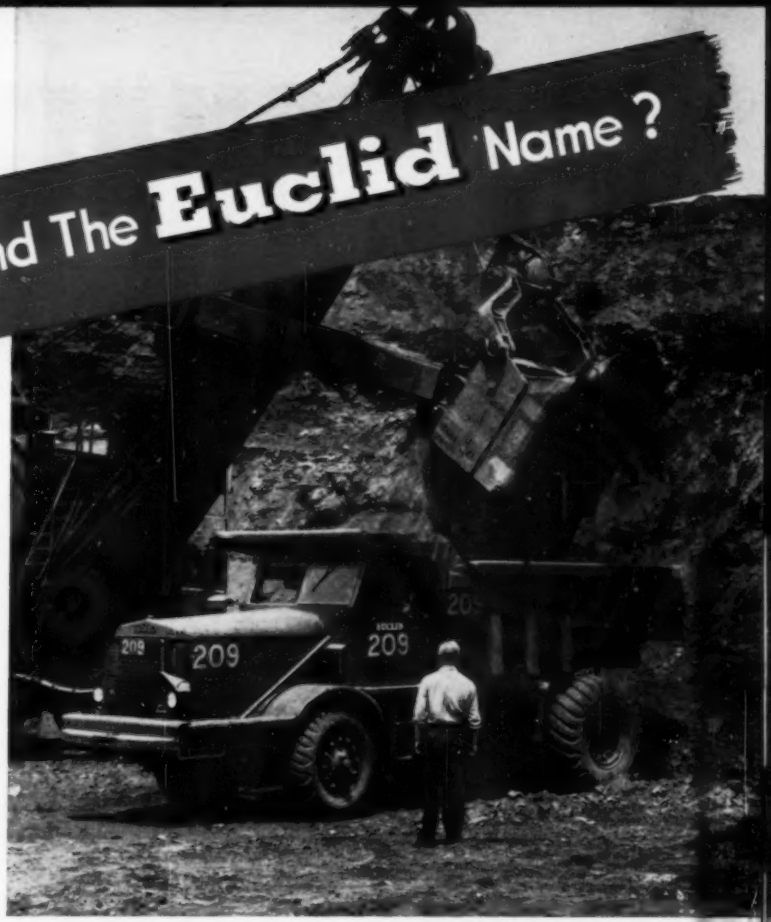
After Myers had leveled the site, there remained a sizeable excavation job for contractor McHugh. Basements, tunnels, sewers and utility trenches had to be dug. The contract specified 60,000 yards of machine excavation, 27,000 yards of rock excavation, 55,000 yards of backfill and 60,000 yards of site grading. Indications were that all these figures would run higher than estimated. Fifty-six thousand yards of dirt and 12,000 of rock were taken out, for example, in excavating for utilities other than electric.

Depth of cut ranged from 12 to 26 feet. Underground passageways connect all main buildings to enable patients and staff to travel from one to another without going outdoors. These

Continued on page 40

• Ground taken from the foundation excavations was moved in Athey PD10 wagons pulled by Caterpillar DW10 tractors. It was levelled at the hillside fill by Cat bulldozers and motor graders.

What's Behind The **Euclid** Name?



* *Dependability*

Euclids are engineered for the job . . . built for efficient, long life performance in off-the-highway service. In mines and quarries, on construction and industrial jobs, "Eucs" have earned their reputation for durability and low cost operation.

Plenty of power . . . large capacity for bigger loads . . . body designs for all types of materials . . . earth, ore, rock, or coal. Rear-Dump Euclids range in capacity from 10 to 34 tons, have diesel engines from 125 to 400 h.p. Bottom-Dump Euclids have capacities of 13 to 50 cu. yds., 20 to 40 tons with diesel engines to 300 h.p.

Repeat orders prove customer satisfaction. Owners say that "Eucs" actually cost less to own than any other hauling equipment. Euclid dependability will pay off on your present or future jobs. Write for complete information on the Euclid line, or call your distributor today.

The EUCLID ROAD MACHINERY CO.,
CLEVELAND 17, OHIO
CABLE ADDRESS: YUKLID — CODE: BENTLEY

MORE LOADS PER HOUR— MORE PROFIT PER LOAD

EUCLIDS

ALLIS-CHALMERS
Sets New Standards

. . . THE NEWEST, FINEST

model **HD-20**
Hydraulic Torque Converter Drive
175 net engine hp.
41,800 lb.

model **HD-15**
102 drawbar hp.
27,500 lb.

Get the full story from your Allis-Chalmers dealer.
See these tractors perform. They're built for YOUR job!

for Tractor Performance
for Lasting Durability
for Simplified Servicing
for Ease of Operation

TRACTOR LINE ON EARTH

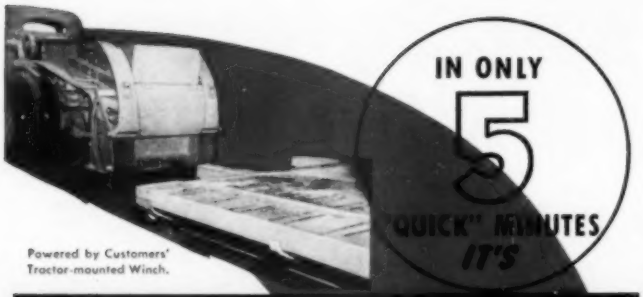
model **HD-9**
70 drawbar hp.
18,500 lb.

model **HD-5**
40.26 drawbar hp.
11,250 lb.

Originator of the Torque Converter Tractor

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



Powered by Customers' Tractor-mounted Winch.

DETACHED, LOADED & RE-ATTACHED

Ready to GO!

ROGERS

POWER LIFT

DETACHABLE GOOSENECK

TRAILER

PATENTS PENDING

Frame is lowered to ground without need of blocking. Maximum height of 16" assures rapid, safe loading of equipment.

Complete Literature available upon request—Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.

DEVELOPED BY

The Trailer Pioneers

ROGERS BROS. CORP.

ALBION, PENNA.

136 ORCHARD STREET

RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS
STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS
CARRIES HEAVIER LOADS MORE PROFITABLY ON LARGER TIRES

Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.

VA Hospital

Continued from page 36

8-ft. wide by 10-ft. high corridors necessitated a 12-ft. deep cut. Basements called for deeper cuts.

Blast holes were put down with two Chicago Pneumatic G200R wagon drills. Holes were charged with Atlas 40% gel. Air spades, concrete breakers and rock drills helped out in the tough digging. These were of Thor, Worthington and Gardner-Denver manufacture. Air pressure was supplied by two Chicago Pneumatic, two Joy, one Schramm and one Champion compressor.

Digging the excavations were a Northwest 25 and a Northwest 4 shovel, a Northwest 95 backhoe, a 2-yd. Lorain 820 dragline and a 1½-yd. Bucyrus-Erie 38-B dragline. Northwest and Michigan truck cranes handled shallow trenching for utilities. Tractor equipment used in excavating and grading included: six Caterpillar tractors, a No. 12 Cat motor grader, a Cat 80 scraper and 28 ripper, and several Caterpillar DW10 tractors with Athey PD10 wagons. An International TD-9 crawler with Hough loader was used in squaring away some of the tunnel excavations.

Lay Inclined Sewer

Putting in storm and sanitary sewers down the side of the hill. It was laid at a 62% grade down the west side to join up with the Pittsburgh sewer system. When necessary, excavations were dewatered with six Jaeger (1½, 2, and 3-in.) pumps.

The estimated 40,000 cubic yards of concrete needed in all structures were being poured at the rate of 400-500 yards per day. Two Bucyrus-Erie 38-B cranes were swinging the 1-yd. and 1½-yd. Blaw-Knox and Insley concrete buckets into position. A local

"Joe sure knows how to make a job interesting."

firm, Vang Ready Mix Concrete Co., was supplying the concrete. Workmen used 14 Vibro Plus and Jackson vibrators to compact the pour.

To keep machines at top operating efficiency, a complete garage was erected on the job site. Here, lubrication, fueling and minor repairs were handled with a minimum of delay.

At the time of EXCAVATING ENGINEER's visit, approximately 500 men were on the job. Key men handling the big contract for James McHugh Construction Co. are: R. L. Senior, project manager; Joe Kirg, general superintendent; young James McHugh, Jr., building superintendent; Charles T. Lyons, excavation superintendent; Clifford J. Berry, purchasing agent; James McHugh, Sr., is president of the Chicago contracting firm.

Although the new neuropsychiatric hospital will be the property of the Veterans Administration, its design and construction is being accomplished under the supervision of Col. Conrad P. Hardy, District Engineer, Corps of Engineers, Pittsburgh District, with Ralph Patt as the Resident Engineer. May, 1952 is the scheduled completion date.

Quebec Bridge

Continued from page 25

livery of steel slowed down the work for about a week, but the Dominion Bridge Co. crews have worked fast to keep up their average when steel was again on hand. Riveting crews will have driven an estimated 35,000 rivets by the time the bridge deck is completed.

Dufresne Engineering Co. also built about 2,000 feet of cantilever type concrete retaining walls which required 2,500 yards of concrete. The three concrete viaduct or overpass bridges required 2,100 yards of concrete.

About 40,000 pounds of dynamite was used on blasting of rock cuts and for loosening shale on the road building work at the various locations.

Paving Finishes Job

Dufresne this spring will pave the short section of road between the south side of the Chaudiere Bridge and the old Charny Road, to connect it to the new Levis bypass. This road leads to Gaspe, along the south shore of the St. Lawrence River. Also to be paved is the 1½-mile north approach road on the Quebec side.

Chief engineer for Dominion Bridge Co. is Fred Bowman of Montreal and J. P. Gignac is engineer in charge for Dufresne Engineering Co. The entire project is under the direction of The Department of Public Works, Province of Quebec, Canada.

Additional Highway

Komo Construction Co. of Quebec has a separate contract from the Quebec Highway Department for construction of the 4½-mile connecting road from the Charny Road to the end of the present Levis bypass boulevard on the south shore, a short distance east of the Etchemin River. Grading is proceeding on this stretch, and paving will be completed in May. The contract calls for a 2-way concrete overpass bridge over the railroad, the bridge to be 27 feet high and 175 feet long. A deep rock cut excavating job also must be done in this section along the CNR railroad line. About 40,000 yards of solid rock is being excavated to enable the new road to proceed over the existing steel highway bridge at the Etchemin River.

Increase your Crane Output

with the bucket built for the job

BLAW-KNOX

CLAMSHELL BUCKETS

THE clamshell bucket is the business end of your crane . . . its performance efficiency plus its ability to stand up under hard usage determines profitable crane output.

That's why *proper bucket selection* is so important . . . that's why so many contractors select Blaw-Knox Buckets, choosing from the wide variety of sizes, weights and types that insure peak crane output on any specific operation.

Blaw-Knox engineering service, backed by many years of experience in clamshell bucket applications, is at your service to help you select the bucket that meets all your requirements.

GET THE MOST OUT OF YOUR CLAMSHELL BUCKET!

Find out how to "reeve the bucket for maximum efficiency", how to "prolong cable life", how to make repairs on worn parts — these subjects, plus many other important "do's" and "don't's", are detailed and illustrated in Bulletin 2373.

WRITE FOR BULLETIN 2373 TODAY

BLAW-KNOX DIVISION

of Blaw-Knox Company

2074 Farmers Bank Building • Pittsburgh 22, Pa.

BLAW-KNOX CLAMSHELL BUCKETS

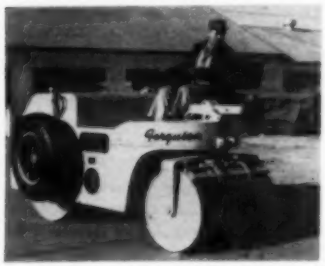
THE MOST COMPLETE RANGE OF SIZES AND TYPES

Equipment
You Ought to Know About

Compactor

Manufacturer: Shovel Supply Co., Dallas 1, Texas.

Claims: A new Ferguson 3 to 5-ton maintenance roller that is instantly portable will trail at normal truck

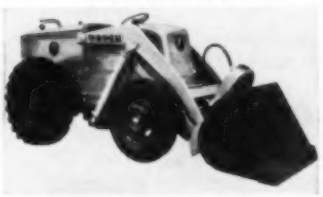


speeds on its own wheels, which are raised and lowered by power-driven hydraulic pump, at the touch of a finger. Towing end of roller is also raised instantly for attachment to truck by power-driven hydraulic cylinder.

Weighing three tons empty, with water ballast it becomes a full 5-ton roller. Forward and reverse movement is controlled by a single lever, with two speeds in each direction. It will operate alongside any standard curb without removing transportation wheels, which can be raised 12 inches above bottom of roller.

Transportation wheels can easily be removed in two minutes by one man. This permits roller to operate within four inches of a fence or wall. Water is controlled by valves within easy reach of operator. Roller is equipped with 75-gal. capacity sprinkling water tanks and mats over both rolls. Spring-actuated scrapers are placed at front and back of both rolls. Engine is 4-cylinder, 20-hp. aircooled.

1¼-Yd. Loader



Manufacturer: Frank G. Hough Co., Libertyville, Ill.

Claims: This addition to the Payloader line has a 1¼-yd. bucket and is available with 60-hp. gasoline or diesel power. Engine is at the rear over the drive wheels for maximum tractive effort and capacity, and the operator is located up where he has a clear view in all directions and of the working area. The model Hy features powerful bucket crowd and automatic bucket tip-back that prevents spillage.

It also offers hydraulic power control of bucket-dump and bucket-close. The HY has full-reversing transmission giving four speeds in each direction—up to 29 mph, and an independent, quick-acting reverse control. Steering is almost effortless because it is power boosted. Digging angle or bucket pitch is quickly adjustable. Maximum dumping clearance is over eight feet.

Single Pass Stabilizer

Manufacturer: Harnischfeger Corp., Milwaukee 14, Wis.

Claims: Single Pass Stabilizer is self-propelled and performs all necessary

operations for complete processing of in-place soils with any type admixture, leaving the materials ready for compaction. It processes in a single pass at a high rate of production and requires just one operator.

Underground Loader

Manufacturer: Service Supply Corp., Philadelphia 32, Pa.

Claims: Especially designed for civilian defense bomb shelter tunnel and protective construction is the underground Lodover, a special adaptation of the standard Lodover. A combination over-head and front-end tractor loader, it loads overhead in a 14-ft. shaft. No turn overhead operation doubles

track life on rock and reduces wear at 19 points in the crawler assembly.

Equipped with the special 1¼-yd. heavy duty rock bucket, the loader can dig its own sloping ramp in and out of the tunnel or shaft. Other advantages include all hydraulic operation, easy on the operator and easy on the tractor.

Many useful attachments, including a dozer blade, angle blade, winch, boom, lift fork and snow plow are available.

Rust Preventive

Manufacturer: Swan - Finch Oil Corp., NYC 20.

Claims: Saf-pHilm Rust Preventive is a new dark-colored, solvent type, organic metal preservative. Especially developed for the protection of highly finished surfaces, parts and equipment prior to storage or shipment. It is a fast drying rust preventive which forms a colored, yet transparent film, within 15 minutes. Film removable with kerosene or solvent. It is noted for forming a tough elastic polar film with the ability to resist acids, alkalies and abrasion.

Hole-Saver

Manufacturer: Rock Bit Sales & Service Co., Philadelphia 25, Pa.

Claims: The Rock Bit Hole-Saver is used to reclaim lost bits and drill steel broken off in the hole so as to save redrilling the hole. Attached to a threaded steel in place of a bit, its peculiar left hand, tapered threads cut in the metal of the broken rod and remove it quickly, easily and without jamming. The tool is threaded for Timken H or

D; Rock Bit R-1 or R-2 steel to fit the following size steels — (a) ⅞-in. Hex., ⅞-in. Q.O.; 1-in. Hex., 1-in. Q.O., 1⅛-in. Rd.; (b) 1¼-in. Rd. and 1⅛-in. Rd.

Paving Breaker

Manufacturer: Reed Roller Bit Co., Houston 20, Texas.

Claims: A light-weight 50-lb. paving breaker can be handled by one man in horizontal or overhead work . . . making it adaptable to a wide range of uses. It is especially suitable for brick work, asphalt-cutting and shop maintenance work. The Cleco RC-50 incorporates the same type valve as that used on heavier paving breakers, which gives full control on both power and return strokes, assuring hard, uniform blows, fast action, minimum recoil, no short-stroking and low air consumption. Wear-resistant alloys, automatic lubrication and heavy-duty construction are featured.

Hard Facing Rod

Manufacturer: Alloy Rods Co., York, Pa.

Claims: Oxy-acetylene welding rod known as Wear-Flame 40 for hard facing against medium impact and high abrasion is a centrifugally cast hard facing rod consisting of highly wear-resistant chromium carbides contained in a hard iron chromium, manganese alloy matrix.

Overlays offer a high resistance to wear on parts subjected to medium impact and compression. Hardness is retained at relatively high temperatures. Hardness of deposited metal is 56-58

DREDGES

HYDRAULIC DIPPER CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

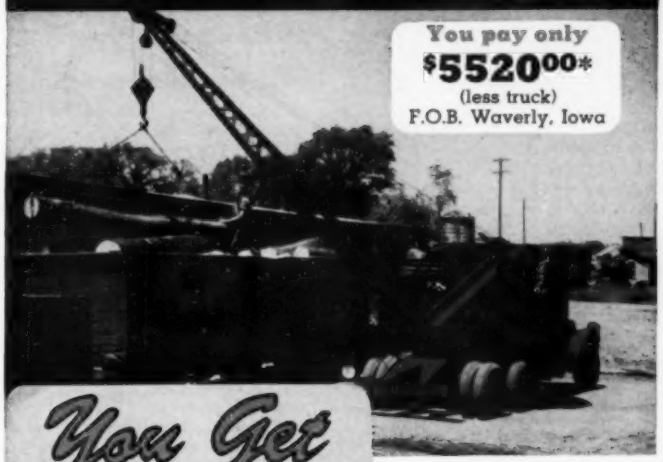
If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

NEVER BEFORE

so much crane for so little money!



You Get

- **10,000 lbs. capacity**
- **Simple mechanical controls**
- **Triple chain drive sealed in oil-filled housing**
- **Triple action boom hoist with power-controlled lowering**
- **Heavy-duty snap-in clutches**
- **3 adjustable hook rollers**
- **6 fast-change attachments**
- **Sealed-for-life ball and roller bearings throughout**

*Prices subject to change without notice

Owners records prove no other crane can equal the *speed, safety and economy* of the new truck-mounted BANTAM®. Costs less than half the price of bigger cranes . . . gives you a flexible, mobile rig for handling all kinds of scattered or close quarter jobs at a saving. Even on production work, Bantam's fast swing cycles and high line speeds usually enable operators to outproduce more costly machines. Best of all, nearly *2000 Bantams in service* prove Bantam's simple, rugged construction means new economies in maintenance.

SB-LO-3

SCHIELD BANTAM

Costs less... goes anywhere fast

GETS MORE JOBS DONE

SCHIELD BANTAM COMPANY
202 Park St., Waverly, Iowa

☐ Send details on truck-mounted Bantam Crane

Name.....
Employed by.....
Position.....
Address.....
City:.....State.....

Rockwell C. Sizes are available in ⅛-in. diameter by random lengths: 5/32 to ⅜-in. diameters by 14-in. lengths.

Lubricating Compound

Manufacturer: Norgahn Co., Wausau, Wis.

Claims: Sludge-free lubricant is ideal for motor grader blade turning mechanisms. In addition, it is recommended as a lubricant for all outside lubricating needs. This compound will adhere to the metal . . . will not mix with water, and its use assures a sludge free lubricant that permits all turning mechanisms to operate easily with minimum wear. It is also adaptable to truck plow chafing plates as a factor in eliminating friction. Ready for immediate delivery, it comes in 18-lb. and 45-lb. containers.

Earth Auger

Manufacturer: Petersen Engineering Co., Santa Clara, Calif.

Claims: With the addition of 10-in. and 12-in. diameter augers, the complete Pengo line now consists of 11 auger sizes for hole diameters from 10 to 36 inches. The augers are made to fit Highway, Williams and Trackson earth boring machines; adapters to make the augers interchangeable on these and other makes of machines are available.

In addition to drilling ordinary ground, the Pengo auger will bore holes in hardpan, permafrost and frozen ground, decomposed rock and some kinds of caliche and sandstone. The twin-helix design eliminates back thrust against the side of the hole, making it possible to drill with less caving in sandy soil.

Each half helix is equipped with a shank plate, each of which is provided with replaceable cutting points of abrasion-resistant alloy steel. Maintenance costs are reduced because wear takes place on the inexpensive replaceable cutting points and pilot bit instead of on the auger itself.

Impact Breaker

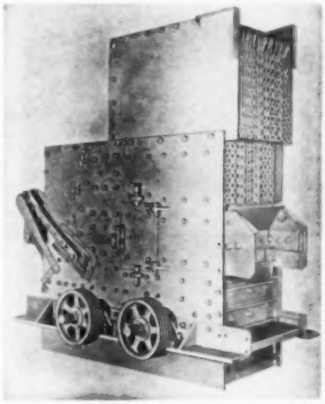
Manufacturer: Pettibone Milliken Corp., Chicago 51, Ill.

Claims: Heavy duty impact breaker features an exclusive operating principle which controls the breaking operation and directs the flow of material through the machine to produce a highly uniform graduation cubical aggregate. Has high ratio of reduction, low hp per ton of finished aggregate, easy access to all parts, and large volume production with minimum plant investment.

The Impact Master consists of an outer plate steel housing forming a breaking chamber over two rotor hammer members which are mounted in its base. Rotors have three rigidly supported hammers each, and rotate on heat treated alloy steel shafts mounted on anti-friction bearings. Both rotor hammers rotate in the same direction at speeds of 550 to 1,000 rpm, promoting fast feeding and keeping all material flowing toward the discharge. Clean cubical aggregate is produced by the impact of the rigidly mounted revolving hammers intercepting rock in motion.

By controlling the in-fed rock and directing its flow, practically 100% of the breaking is accomplished by the rotor hammers making it possible to better control the finished product size. Size of finished material is governed by the speed of the rotors, and by adjustments of a stripper bar and a lower screen grate both of which are protected from damage by tramp iron with automatic return spring-loaded safety devices.

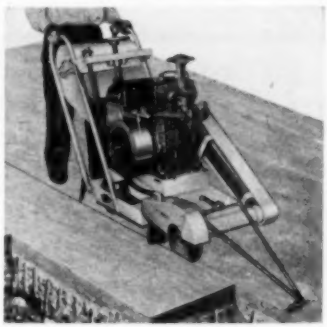
It has a ratio of reduction between 32/1 and 40/1. It will accept quarry



run rock up to 50 inches long that will pass freely through a 32x40-in. opening and will reduce it to specification material in one operation. The machine has a capacity of 250 tons per hour of minus 2½-in. in average limestone, and in many types of rock capacities of 125 tons of minus 1-in. are possible.

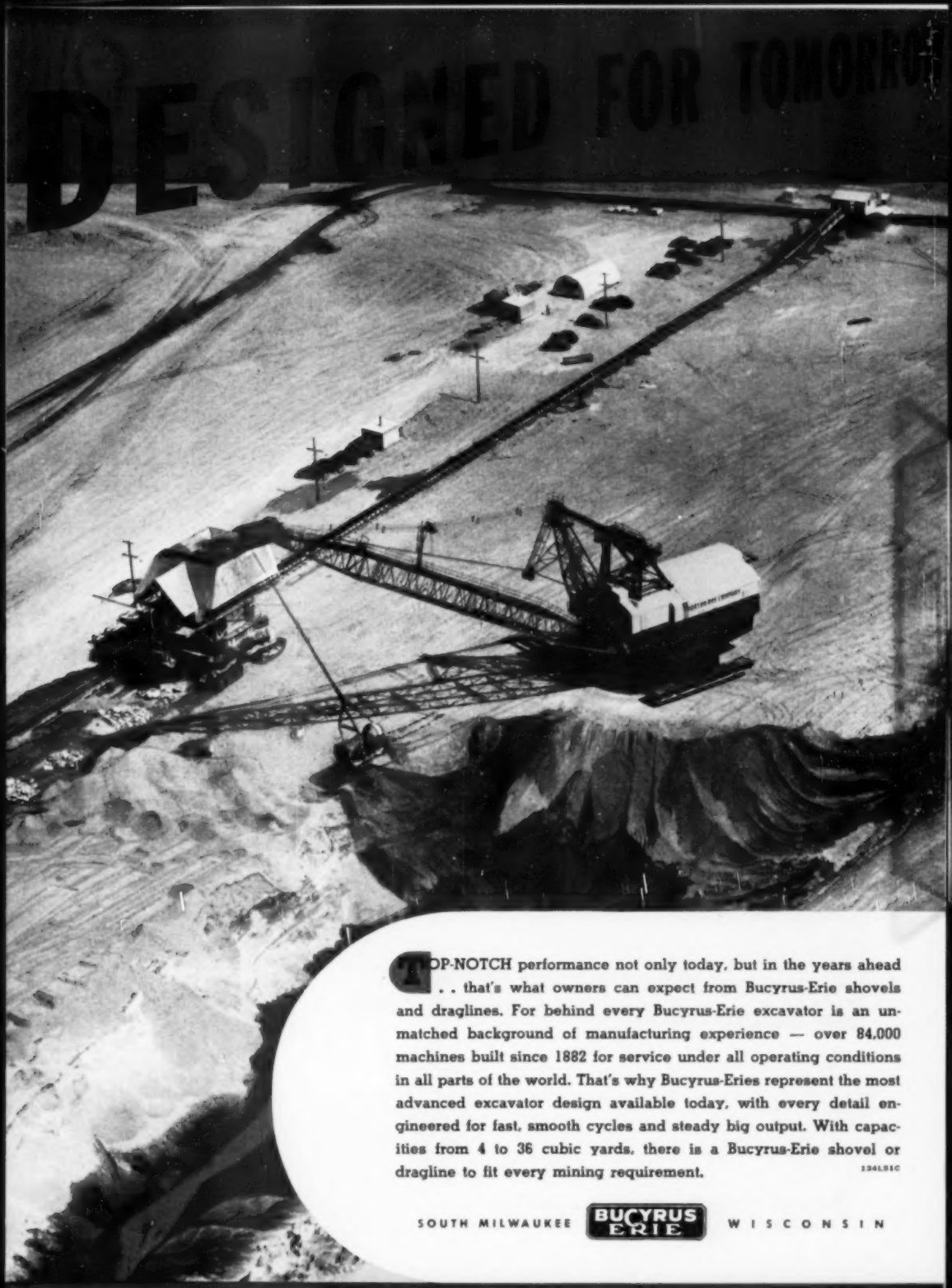
HYDRA-HAMMER and ONE MAN REPLACES ALL THESE!
REPLACES:
3 men each using a $300 jackhammer
$4700 compressor for jackhammers
$2900 tow truck and driver,
or
$3800 breaker and operator
$5400 compressor for breaker
$2300 tow truck and driver for breaker and compressor
Save time and money on labor and equipment with the revolutionary Ottawa Self-Propelled Hydra-Hammer. No skilled operators needed for this multi-purpose tool, any man able to drive a truck can learn to operate the Hydra-Hammer in an hour.
The Hydra-Hammer travels under its own power up to 12 MPH. Converts from travel to work position by elevating the tower and shifting gears. No extra engine or hose couplings to slow production. The 400-pound hammer falls free, eliminating shock and high maintenance costs.
Write today for descriptive booklet . . . see how you can reap profits from the amazing Self-Propelled Hydra-Hammer!
Ottawa
STEEL PRODUCTS, Inc.
INDUSTRIAL DIVISION
OTTAWA, KANSAS • U.S.A.

Concrete Saw



Manufacturer: Clipper Manufacturing Co., Kansas City 8, Mo.

Claims: Cutting speed is 12 feet per minute in asphalt, and up to five feet per minute—one inch deep—in limestone concrete. The maximum depth of cut is 6½ inches. Readily portable, these new clipper saws have available a complete selection of Metal Bonded



TOP-NOTCH performance not only today, but in the years ahead . . . that's what owners can expect from Bucyrus-Erie shovels and draglines. For behind every Bucyrus-Erie excavator is an unmatched background of manufacturing experience — over 84,000 machines built since 1882 for service under all operating conditions in all parts of the world. That's why Bucyrus-Eries represent the most advanced excavator design available today, with every detail engineered for fast, smooth cycles and steady big output. With capacities from 4 to 36 cubic yards, there is a Bucyrus-Erie shovel or dragline to fit every mining requirement.

134LB1C

SOUTH MILWAUKEE BUCYRUS ERIE WISCONSIN

Ask the men who live with wire rope...

They insist on genuine

CROSBY CLIPS

Drop-forged
Hot dip galvanized
SIZES FOR ALL WIRE ROPE
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

Diamond blades suitable for sawing concrete with limestone, flint, or granite aggregate as well as asphalt. Two gasoline powered Clippers, the model C-75 with 7½-hp engine, or the C-130 with a 13-hp, 2-cylinder engine, are available. Models C-15 and C-20 with electric motors are produced for smaller jobs. The model CHD makes it possible for present owners of Clipper model HD's to convert their masonry saws for concrete sawing.

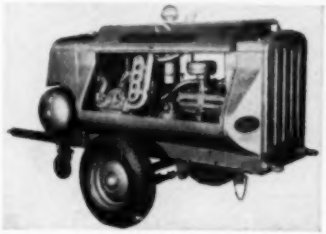
Anti-Rust Compound

Manufacturer: Gulf Oil Corp., Pittsburgh 30, Pa.

Claims: Recommended for protection of metal surfaces against corrosion in either indoor or outdoor exposure during shipment and for either indoor or outdoor storage for long periods of time, Gulf No-Rust No. 6 is a rust preventive of the thin film type and will provide approximate surface coverage of 390 square feet per gallon. It has no tendency to settle or separate in storage, and due to excellent adhesion the coating when once applied and dried will not crack, chip, scale or disintegrate at temperatures down to 0° F., nor will it flow at temperatures as high as 190° F.

This new rust preventive will deposit a coating not exceeding eight-thousandths of an inch in thickness by dipping at a temperature of 70° F. and will dry sufficiently within four hours to permit handling without removal of the coating. It is suitable for application by brushing, spraying, or dipping and is readily removed with standard solvent, kerosene, or similar petroleum solvents.

Portable Compressor



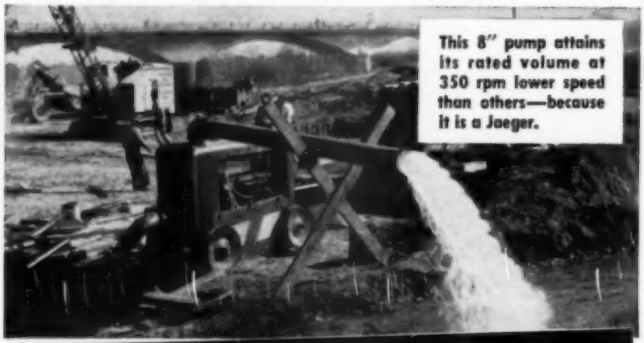
Manufacturer: Gardner-Denver Co., Quincy, Ill.

Claims: Compressor is powered by a 6-cylinder engine with a 3-7/16-in. bore and 4½-in. stroke. The piston displacement is 230 cubic inches.

The portable compressor provides an all water cooled 105-cfm unit which assures cooler air to the tools and thus keeps tool upkeep to a minimum. Being a two-stage air compressor, adequate rated capacity at any altitude is assured. Air is compressed to 28 pounds in the first stage, cooled back almost to atmospheric temperature in a radiator-type intercooler, and boosted to final discharge pressure in the second stage.

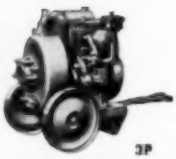
The improved Gardner-Denver unloader pilot operates the suction unloading valves within a fixed range and automatically throttles the engine to idling speed and unloads the compressor.

2100 gallons every 1150 revolutions



JAEGER pumps pull stronger, pump longer

Because Jaeger dewatering pumps are built oversize, to produce full rated volume at easier speeds, they also hold more priming water and are subject to less abrasive wear. Combined with double priming action and positively lubricated seal (Jaeger patents) they insure fast, sure priming without vapor lock on the toughest pulls, sustained efficiency on nonstop pumping, and thousands of extra hours of service from both pumps and engines.



3P
Others 1½" to 10"

See your Jaeger distributor or send for Catalog P-10.

THE JAEGER MACHINE CO. 553 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY

"Jones operates an air hammer for the city street department."

Everything

YOU WANT TO DO A JOB: MARION WALKING DRAGLINE

A rare combination of performance features is available in MARION Walking Draglines. . . . Before you buy excavating equipment for drainage, reclamation, stripping, levee, heavy construction or sand and gravel work, first learn—without obligation—how MARION Walkers might do the job better, faster and more economically. . . . MARION Walkers are making proud records on many jobs across the country. They work and travel easily in soft footing. For example, the MARION 7200 pictured here is on a construction project, can swing a 7 cu. yd. load up to 230 feet and raise it 135 feet. A 5 cu. yd. load can be swung 305 feet, raised 137 feet.

MARION Walkers in three sizes (5 cu. yds. to 30 cu. yds.), are built in the MARION tradition—expertly designed, made of the finest materials and incorporating many extra-value features that make you glad, year after year, that you chose a MARION. . . . Your nearest MARION sales office will be happy to give you the details. Or write to the factory for information.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

Steam 3/4 cu. yd. to 45 cu. yds.

NOT in the *Contract*

The old Engineer pulled his engine up to the water tank and briefed the new fireman.

The fireman got up on the tender and brought the water spout down all right, but somehow his foot caught in the chain and he stepped right into the tank.

As he floundered in the water, the Engineer watched him with jaundiced eye.

"Just fill the tank with water, sonny," he drawled. "No need to stamp the stuff down."

Little Claude's mother had reluctantly allowed her precious child to attend public school. She gave the teacher a long list of instructions.

"My Claude is so sensitive," she explained, "don't ever punish him. Just slap the boy next to him. That will frighten Claude."

In a night club, a gal wearing a daring low-cut gown was pointed out to a contractor. "That girl," said the fellow, "is wearing a $1,000 gown."

"True," answered the contractor, "but her heart isn't in it."

Two Russians were discussing the chances of war. One said that if it came, Russia would win.

"As soon as we develop the atom bomb, we send six or seven agents to America, each with an atomic bomb in a suitcase. They will set off their bombs simultaneously in the great cities. That will finish the war."

"We couldn't do it," said the second Russian.

"Why? Don't you think we shall have the atomic bombs?"

"Oh, we'll have the bombs," replied the skeptic. "But where are we going to get the suitcases?"

"Boy!! Talk about powerful engines!"

A farmer who called his newly-employed hired man out of bed at 4 A. M. was surprised a few minutes later to see the man walking off down the road. "Hey," shouted the farmer, "come back here and eat your breakfast."

"Who's going to work? I'm going to find a place where I can spend the night!"

Prof: "Describe the mechanism of the steam shovel."

Student: "Don't kid me, you can't shovel steam."

And then there's the cannibal's daughter who liked the boys best when they were stewed.

This is a little story about jumping to conclusions.

A family in Germany was enjoying a special mushroom dish for supper. Suddenly they noticed the family cat under the table—mewing piteously and writhing in pain.

Papa, who just a few moments before had given the animal a taste of mushrooms, rushed the entire family to a hospital where all had their stomachs pumped.

Shaky from the ordeal, but grateful to the cat for the timely warning, they returned home. There was their benefactress, still under the table, cuddling seven new kittens.

The men in the nudist colony were giving the new entrant a bit more than a glance. One of them exclaimed, "Man, I'll bet she looks good in a sweater."

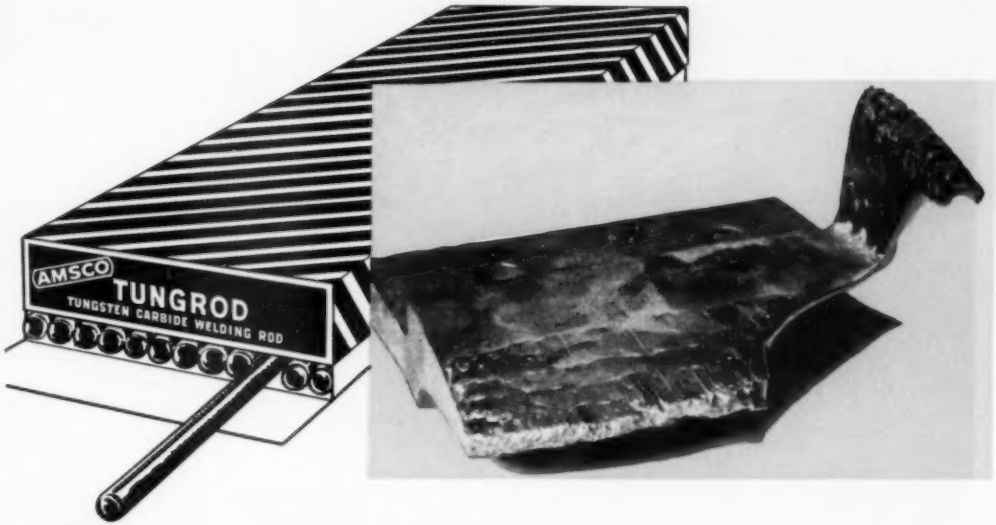
First Customer: "It's fellows like you who spoil it for the rest of us — giving that girl a dollar tip!"

Second Customer: "Well, look at the hat she gave me!"

A little girl was sent to the drug store for something to stop palpitation. Since it was a long walk to the store, and the girl had a short memory, here's what she said to the druggist: "Mother said she wanted something that will stop population."

And then there was the guy, slightly under the influence of liquor, who met a rattlesnake in the road and said:

"Strike if you must; I was never in better condition."



Saved HUNDREDS OF DOLLARS PER MONTH IN PULVERIZING!

An example of how the AMSCO Hardfacing System can help you fight wear profitably

Here's why the AMSCO HARDFACING SYSTEM can save you money

Hardfacing recommendations are as sound as the manufacturer who makes them. For a half-century, Amsco has specialized in fighting the high cost of wear—first with manganese steel and later with another big weapon . . . AMSCO Hardfacing Rods and Electrodes.

The result is the AMSCO Hardfacing System . . . where a wide range of Amsco Rods are selected for use according to a systematic appraisal of the equipment part and wear factors involved.

Whether your particular problem is one of wear caused by impact, abrasion, heat, corrosion—alone or in combination . . .

Amsco has both the research facilities and the years of on-the-job experience necessary to help you make important reductions in your operating costs.

A large Pennsylvania brick company was faced with this problem: their pulverizer plows wore out every two weeks due to extreme abrasion of clay with a high silica content. An expensive period of down-time and replacement labor resulted.

In trying to stop this high replacement cost, a test was made. Each plow was hardfaced with AMSCO Tungrod—specially developed by Amsco research for high resistance to abrasive wear.

Result? The plows hardfaced with AMSCO Tungrod lasted 4 times as long . . . 3 out of every four replacement jobs were eliminated! The saving amounted to several hundred dollars *each month!*

AMSCO Tungrod permits big savings—through longer service and fewer replacements—on many other applications. If you have an equipment part used in cutting or pulverizing non-metallic materials, the possible savings—*to you*—are too big to be overlooked!

Write today for illustrated hardfacing catalog — and nearest distributor's name.

AMSCO®
WELDING PRODUCTS

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
373 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

No body-hoist

CUTS MAINTENANCE COSTS . . . SPEEDS HAUL CYCLES

Koehring Dumptors have no slow-working body hoists. Trip the release lever and gravity dumps the 6-yard load in one second. It's as simple as that! No complicated mechanical hoists to slow up haul cycles . . . no expensive replacement parts, costly hoist maintenance or down time to eat into your profits. And gravity dump is instantaneous and trouble-free in all temperature extremes . . . never wears out.

No costly spring maintenance is another money-saving advantage you get with Koehring Dumptors. There is just one big, double-coil chassis spring on steering axle . . . none on driving axle. Extra-big, shock-absorbing drive tires eliminate need for more. You save spring maintenance time and replacement costs.

Check your body hoist and spring maintenance costs for a year . . . see how much you'll save by using Dumptors. What's more, Dumptor's no-turn shuttle haul and constant-mesh transmission for 3-speed travel forward and reverse, increase production . . . and your profits. See your Koehring distributor now for all the facts . . . or send today for the informative 28-page Dumptor catalog.

KOEHRING CO., Milwaukee 16, Wis.

Subsidiaries: KWIK-MIX • JOHNSON • PARSONS

CK121

KOEHRING HEAVY DUTY

KOEHRING DUMPTOR®

CRANES UP TO 79½ TONS LIFT CAPACITIES . . . EXCAVATORS UP TO 2½ YARDS

Dumptor body release lever is conveniently located alongside steering wheel . . . there's no reaching or stretching necessary . . . trip lever engages trip rod on body.

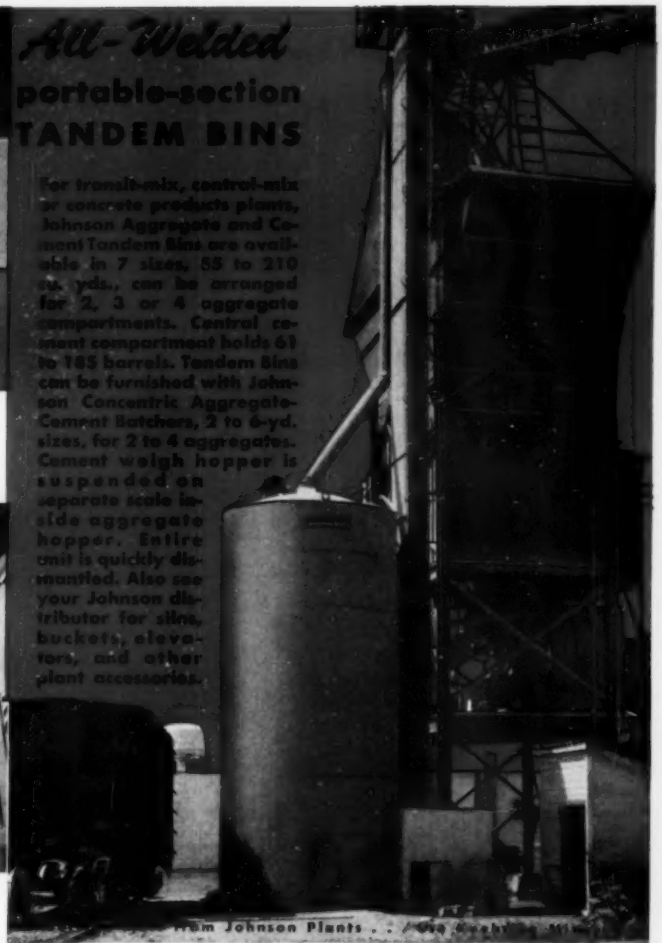
Trip rod instantly releases latch hooks from latch seat on chassis frame . . . and gravity dumps the load. Latch automatically locks as body returns to loading position.

Scoop-shaped Dumptor body rolls on heavy-duty rockers. Snub chains are attached to big, coil-spring shock absorbers, which check the body at approximate 70 degree tilt.

All-Welded

portable-section TANDEM BINS

For transit-mix, central-mix or concrete products plants, Johnson Aggregate and Cement Tandem Bins are available in 7 sizes, 55 to 210 cu. yds., can be arranged for 2, 3 or 4 aggregate compartments. Central cement compartment holds 61 to 185 barrels. Tandem Bins can be furnished with Johnson Concentric Aggregate-Cement Batchers, 2 to 6-yd. sizes, for 2 to 4 aggregates. Cement weigh hopper is suspended on separate scale inside aggregate hopper. Entire unit is quickly dismantled. Also see your Johnson distributor for silos, buckets, elevators, and other plant accessories.



Also check Johnson EXTRA-TONNAGE CLAMSHELLS . . . .

Smooth, inside and out, Johnson all-welded clamshells dig and dump with less resistance . . . are fast-filling, easy-closing. Big needle-bearing-mounted sheaves reduce power loss, deliver full power to cutting lips and teeth. Low center of gravity lets bucket dig in straight and deep. Hard manganese cutting edge, welded to heavy lips, gets tougher with use, assures big tonnage performance. 3 types and 9 sizes . . . from ⅜ to 2½ yds.

W10

Receiving Hoppers | **C.S. JOHNSON CO.** | Skip Hoist Buckets

Notes from the manufacturers

George Haiss Mfg. Co., Inc., York, Pa., has named Phillip Levin as sales manager, bucket division. Mr. Levin joined Haiss in 1946 after serving five years in the Army Transportation Corps.

Alloy Rods Co., York, Pa., has announced the appointment of E. R. Walsh as general sales manager. Mr. Walsh has been associated with the company for several years as district sales manager. He will devote most of his time to the distribution and sale of the complete lines of arc welding electrodes.

Lincoln Electric Co., Cleveland, Ohio, has elected W. R. Persons to vice president in charge of sales. He was formerly general sales manager. Mr. Persons joined Lincoln in 1934, going to the Pittsburgh branch office as a welding engineer. He graduated from the Case Institute of Technology with an M.S. degree in engineering in 1932. He was made district manager of the Pittsburgh territory in 1937 and was active there until 1945 in welding development in steel making and manufacturing industries.

Joy Manufacturing Co., Pittsburgh, Pa., has appointed Capitol Equipment Co., Inc., Harrisburg, Pa., as exclusive distributor of Joy construction equipment for an area covering 16 counties of central Pennsylvania, lying west of Berks and Northumberland. Sales and service representation will include Joy's complete line of equipment. Joy also appointed Eastern Tractor & Equipment Co., Portland, as exclusive distributor of Joy construction equipment for the state of Maine.

Cooper-Bessemer Corp., Mt. Vernon, Ohio, announces the election of Charles G. Cooper, manager of Cooper-Bessemer's Washington office, as vice president at the recent board of directors' meeting. Son of the late C. G. Cooper, former Cooper-Bessemer president, and grandson of Elias Cooper, one of the company founders, Mr. Cooper is a graduate of the Sheffield Scientific School of Yale University, 1926. He served as a field and service engineer with the Chapman Stein Co., former Cooper-Bessemer subsidiary, until 1931 when he joined Cooper-Bessemer's New York office as sales engineer. In 1933, Mr. Cooper established the Washington office that he has managed ever since.

Caterpillar Tractor Co., Peoria, Ill., has created a new sales unit known as the plains division to handle an increase in sales volume which is three times the pre-war level. The new set-up means that Caterpillar now has four administrative sales divisions, namely, western division, central division, plains division, and eastern division. To staff the new organization, the following promotions have been announced: Kenneth F. Ames, former head of sales training, will become sales manager, plains division; with Lee Morgan, former supervisor of agricultural advertising and recently district representative in New York state, and Gordon Fowler, former eastern sales division assistant, serving as assistant sales managers.

Marion Power Shovel Co., Marion, Ohio, has named John C. Priest as sales representative in the Chicago district office. Mr. Priest will work out of Marion's Chicago district office located in the McCormick Building.

Hose Accessories Co., Philadelphia, Pa., announces the appointment of Arthur W. Gadd, as manufacturers' representative for the states of Missouri, Kansas, Southern Illinois, Western Iowa and Nebraska. Mr. Gadd has a broad background in the industrial distribution field.

Hercules Powder Co., Wilmington, Del., announces the completion of a 3-story addition to the main laboratory building at its experiment station near Wilmington. The new wing is the major project in a series of expansions made during the past five years. The addition provides 26

Designed For Longer Life!
Omaha Dragline Buckets are built extra strong for the extra tough digging jobs. Successful contractors everywhere show a greater volume of work — a bigger profit — a larger saving in maintenance with "Long-Life" Omaha Buckets. Four types available. Write for catalog giving complete information and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

"I hear there's a terrible electrical storm in town."

"Washington calling!"

We were expecting this call. In a sense it is the people of America on the other end of the telephone. For some time they have been calling upon our government to take whatever steps are necessary to equip our fighting men for any job they may have to do.

Korea has proved the fallacy of limited preparedness. You know now that the nation is girding for survival. The people of America have said—and rightly—that private industry should provide the Armed Forces with whatever is necessary.

Machines are being mobilized. "Caterpillar" products are wearing olive drab once more. Because of large military demands your present machines may have to work longer than you had anticipated.

You can get many extra hours of machine service life if you:

1. **Follow a sound program of operation and maintenance.**
2. **Consult your Operator's Instruction Book, using it as a constant guide in caring for your machines.**
3. **Secure the assistance of your "Caterpillar" dealer who now, more than ever before, is your working partner for the grim job that may lie ahead.**

. . .

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

new laboratory units accommodating 51 chemists and increases the research facilities of the main building by more than 60%. Hercules also announces removal of the San Francisco office to the Standard Oil Building, 225 Bush St. The company's headquarters in San Francisco were formerly located at 256 Montgomery St.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named Willis C. Scholl sales manager of the tractor division. Mr. Scholl has been eastern territory manager of the tractor division's sales force since 1947. In this capacity he supervised the firm's industrial and farm equipment branch organization in the eastern part of the United States and Canada.

R. G. LeTourneau, Inc., Peoria, Ill., announces the appointment of James W. O'Connor and J. W. (Bill) Gulledge to the company's field engineering staff. Before coming to LeTourneau, Mr. O'Connor served with the Seabees from 1943 to 1946, spending two years in the South Pacific working with heavy construction equipment. Formerly with Massachusetts State Highway Dept. and with a sand and gravel company in Massachusetts, he received his Bacalor of Science degree in Civil Engineering from the Missouri School of Mines and Metallurgy. Mr. Gulledge, before coming to LeTourneau, served in the Navy as a mine technician. He studied engineering at Bradley University, University of Illinois and Illinois Institute of Technology. He spent 18 months in the Pacific working in a civilian capacity in the Design Branch of the Okinawa Engineering District working both on the islands of Okinawa and Japan.

Cooper-Bessemer Corp., Mt. Vernon, Ohio, named Walter M. Kraemer to its field sales and service office in San Francisco, Calif. Mr. Kraemer has been associated with Cooper-Bessemer's recent development of new nodular iron, working directly under T. E. Eagan, Cooper-Bessemer chief metallurgist.

Koehring Co., Milwaukee, Wis., has named Cunningham-Ortmayer Co. of Milwaukee distributor for the C. S. Johnson Co. in the Wisconsin area. Adding the Johnson line makes the Cunningham-Ortmayer organization a complete Koehring distributor. The firm has handled Koehring construction equipment for many years along with products of the Kwik-Mix Co. of Port Washington, Wis. and Parsons Co. of Newton, Iowa, both Koehring subsidiaries. Also, C. S. Johnson Co., has named Kemp Yorke to handle sales of Johnson concrete batching and cement handling equipment in Southern California. He will maintain an office in Los Angeles.

Mack Manufacturing Corp., NYC, and Wooldridge Manufacturing Co., Sunnyvale, Calif., have signed an agreement, wherein the Wooldridge Company will partially produce and fully assemble Mack off-highway vehicles in their main Sunnyvale plant. The vehicles which operate off the public highways, will be specially designed to fit the needs of western contractors, miners and loggers. Plans are being rushed for the construction of a $250,000 modern assembly plant.

Frank G. Hough Co., Libertyville, Ill., played host to more than 200 distributors from the United States and Canada on January 27. The occasion for this gathering was to cele-

BIG STEADY OUTPUT

with Bucyrus-Erie Red Arch Buckets

Take smooth efficient digging performance, multiply it by long bucket life, and you have big steady output — the kind you get with Bucyrus-Erie Red Arch dragline buckets. They're correctly shaped for fast loading and dumping, balanced for smooth carrying, and ruggedly built for long non-stop use.

Careful design provides great strength without unnecessary weight. Plate, castings, and fittings are made from selected alloys carefully checked by our own laboratories. In addition, vital parts undergo special hardening and heat treating processes, giving each part the necessary strength characteristics.

That's why you're bound to be ahead with the bucket that puts the accent on STEADY high output — Red Arch! Write for latest information.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

brate the completion of a building program that doubled the production capacity of the firm in less than a year. These new facilities include a high-bay assembly building 96 feet x 306 feet and enlarged painting, parts and material storage facilities. In addition a new one story office building was dedicated having 18,500 square feet of floor space and accommodating the administrative, sales, advertising, accounting and engineering departments. It features the latest type of fluorescent lighting recessed in the ceiling and radiant heating in the floor.

Caterpillar Tractor Co., Peoria, Ill., has designated Coalville, a town of 5,000 population, near Leicester and about 35 miles east of Birmingham, as the new home of the British subsidiary. The company has leased a building from the British government for warehouse use there. This will not, by itself, be adequate for the ultimate size of the operation contemplated, but will satisfy requirements for some time while the new organization grows. Additional space will be brought into use later. Personnel have already moved into the new location from the temporary headquarters which the company had been occupying in Lancashire.

Worthington Pump and Machinery Corp., Harrison, N. J., has appointed A. William Fraser midwest sales manager. He will direct the sales of Chicago, St. Paul, Kansas City and St. Louis offices, making his headquarters in Chicago. Mr. Fraser joined Worthington in 1929 and became sales engineer in various Worthington offices and plants throughout the country. In 1937 he became Chicago district manager and in 1945 general European manager.

"Oh, Honey, this paved section is just like flying after all those bumps."

How Florida
SAVES TIME and MONEY
on BRIDGE MAINTENANCE

Idea for YOU!

To speed repair of damaged bridges, Florida's State Road Department developed this mobile maintenance unit, including completely equipped machine shop, mounted on a *10-ton La Crosse low bed trailer*. Outfit carries everything from sledges to 24" lathe, welder, compressor, generator, grinders, burners, etc. A *25-ton La Crosse low boy* with 3-ton crane and 30,000 lb. winch is also used for hauling and placing heavy bridge materials. Florida now operates three such mobile repair units, called "indispensible", by Maintenance Engineer E. C. DeGarmo. You, too, can speed work, cut costs by "mobilizing" your equipment on job-proved LaCrosse trailers . . . 6 to 67 tons capacity . . . single, dual or tandem axle . . . custom-built to your specific needs.

LC-18

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

☐ Rush complete information on La Crosse trailers:
☐ Specifications ☐ Prices ☐ Delivery
☐ Send name of nearest La Crosse Distributor.
☐ We may buy a ..... ton trailer about .....
(date)

Name.....Title.....
Employed by.....
Address.....
City.....State.....

LaCROSSE
America's Favorite LOW BED TRAILER

New trade literature

Title: **Wall Form Construction**
Subject: Catalog describing the Uni-Form system of wall form construction. Widely used in every type of concrete forming work, this type of construction is completely described and illustrated.
Where to get: Universal Form Clamp Co., 1428 Kostner Ave., Chicago, Ill. (Free)

Title: **Roller and Crane Catalogs**
Subject: Two catalogs featuring design and application of the Hystaway excavator-crane and the Grid Roller contain operational photographs and complete specifications. Components of the Caterpillar-mounted crane are the shovel, dragline, crane, backhoe and clamshell, each of which is pictorially presented and described fully and separately. Mounting procedure and dimensional data are presented in clear and concise style. Listed also are optional equipment and attachments available. The Grid Roller catalog introduces the newest piece of equipment in the Hyster line and shows practical applications on highway salvage jobs throughout the country. Towed by either a Caterpillar motor grader or tractor dependent on grades, it is described in a seven-phase, step-by-step style. Details of the drums, grids and weight factors are fully interpreted.
Where to get: Hyster Company, Portland 8, Ore. (Free)

Title: **Diesel Power**
Subject: Leaflet describing diesel power of plants producing crushed stone, agricultural lime, sand and gravel. Thirty-one case histories of Cummins engines in the aggregates industry are given.
Where to get: Cummins Engine Co., Columbus, Ind. (Free)

Title: **Truck Power**
Subject: Two booklets covering Cummins and General Motors powered Euclid equipment. These list by model number the various diesel engines and the Euclid equipment in which they are available. Specifications for Euclid rear-dump and bottom-dump hauling units, scrapers and loaders are included, as are lists of engine dealers and Euclid distributors in the United States and Canada. Copies of form EGM-1 covering General Motors and ECE-10 on Cummins powered Euclids are available.
Where to get: Euclid Road Machinery Co., Cleveland 17, Ohio (Free)

Title: **Corrugated Metal Pipe**
Subject: Brochure lists the types of full-round pipe and Pipe-Arch available to meet the specific requirements for various types of sewers, culverts, conduits or irrigation systems. The booklet also contains reference data for assistance in selecting the most suitable structure. Also included are details on fittings and instructions on the installation of Armco drainage structures.
Where to get: Armco Drainage & Metal Products, Inc., Middletown, Ohio (Free)

Title: **Diesel Engines**
Subject: Construction and operation features of the Nordberg 4-cycle, 1-cylinder and 2-cylinder, vertical, mechanical injection, type 4FS diesel engine are discussed. Engines described are built with a 4½-in. bore and 5¼-in. stroke and are available with electric or manual starting. Within an operating speed range of

CUT DIGGING COSTS

with the new Sherman Power Digger

Patented, actuated bucket gives you selective digging action, better loading, greater versatility.

All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

SPECIFICATIONS

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	.5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

Standard tractor mounting gives unmatched maneuverability and transportability.

•

Digs ditches, trenches, footings, culverts, basements and other excavations.

Works well behind the tractor at any angle.

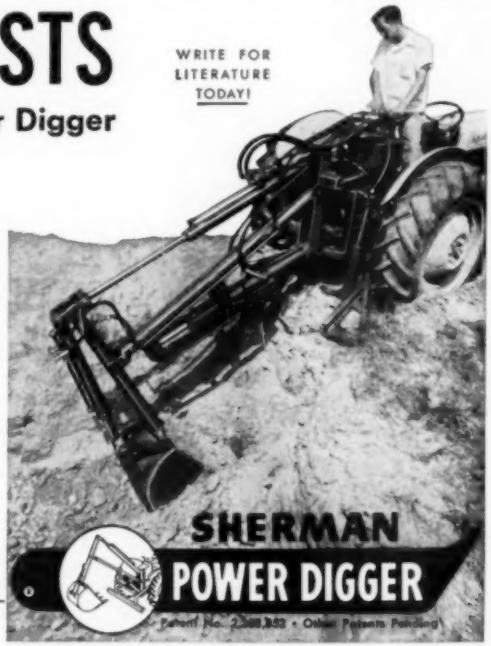
•

Actuated bucket raises high enough to load standard dump truck.

•

Handles roots, rocks, hard clay and oiled road surfaces.

WRITE FOR LITERATURE TODAY!



Designed, Engineered and Manufactured Jointly By
SHERMAN PRODUCTS, INC. • Royal Oak, Michigan
WAIN-ROY CORP. • Hubbardston, Massachusetts
Sold Exclusively By SHERMAN PRODUCTS, INC.

SHERMAN PRODUCTS INC., ROYAL OAK, MICH.

1,200 to 1,800 rpm, the 1-cylinder engine develops 10 to 15 hp and the 2-cylinder unit, 20 to 30 hp. Bulletin illustrates these various engine applications and gives kilowatt ratings and pumping capacities of the different models. Pictured are all main engine parts and specifications.
Where to get: Nordberg Manufacturing Co., Milwaukee 7, Wis. (Free)

Title: **Jack Catalog**
Subject: Bulletin illustrates and describes complete line of ratchet, screw and hydraulic jacks in capacities from 3 to 75 tons. Features include a table of contents by jack models and by industries, a table to help select the correct jack, application pictures, recommended uses for jacks, special features of jacks and detailed specifications.
Where to get: The Buda Co., Harvey, Ill.

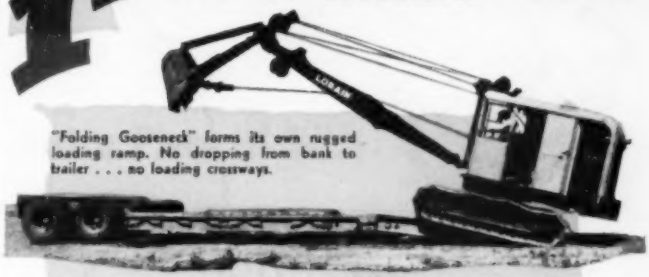
Title: **Small AC Welder**
Subject: Bulletin lists all the features of the TR-180A limited input welder and illustrates a number of its applications. Welder has a welding service range of from 20 to 180 amperes for the welding requirements of shops, garages, fabricators, farmers, etc.
Where to get: Harnischfeger Corp. Welding Division, 4400 West National Ave., Milwaukee 14, Wis. (Free)

Title: **Performance Reports**
Subject: Users of heavy, rubber-tired earth-moving equipment will be interested in the performance reports of actual-on-the-job observations, where payloads of all competing units are weighed and accurate, impartial time studies obtained. These performance reports as well as a 4-page brief entitled *The Trend In Rubber* are available.
Where to get: M-R-S Manufacturing Co., P. O. Box 336, Flora, Miss. (Free)

Title: **Construction Management**
Subject: Information directly pertinent to construction job organization and management is quickly available in an annotated bibliography of 52 selected references to books and periodical articles. These selections deal with construction job planning, work scheduling, costing, organization, preparation of material-requirement charts, material-delivery time scheduling, job progress records, time studies, material and equipment control, and contracting procedures on various kinds of contracting and

Continued on page 59

1ST MARTIN FOLDING GOOSENECK TRAILER



"Folding Gooseneck" forms its own rugged loading ramp. No dropping from bank to trailer . . . no loading crossways.

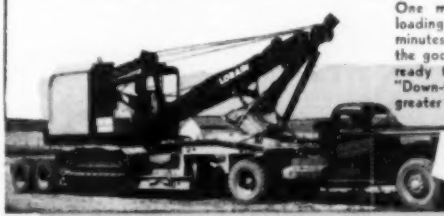
IS STILL NO. 1

with Frank Poetter, Lewistown, Montana, Contractor

● Frank Poetter bought the first Martin "Folding Gooseneck" Trailer to roll off the assembly line at Martin's Kewanee, Illinois, plant. That was several years ago. Right off, it was No. 1 with him, and it still is! Listen to what he says: "My Martin 'Folding Gooseneck' is the trailer I had looked for ever since my first day handling heavy equipment. There is no other trailer that I have used that compares with it!

"Contracting small utility jobs, as we do, it is necessary to move from one to three times a day. The savings in equipment operating time *(we save an hour or more on every shovel move)*, plus the savings in man power and the elimination of hazards, make our Martin Trailer our best equipment investment.

"Our operators like the Martin 'Folding Gooseneck' Trailer, too, because they can load any of our equipment from ditchers to shovels with perfect safety, though conditions are usually a long way from ideal. And one man handles the entire loading operation!"



One man handles the entire loading operation in about 5 minutes. Truck power takes up the gooseneck and the outfit is ready to roll to another job. "Down-to-earth" platform gives greater clearance and stability.

Your Martin Dealer is your "CATERPILLAR" Dealer

MARTIN Trailer

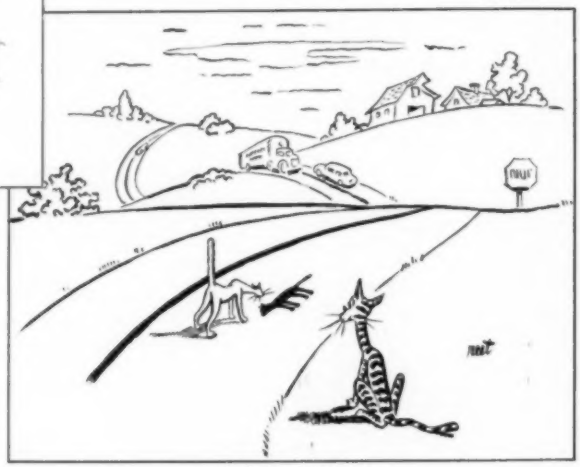
KEWANEE ILLINOIS

EX LAFFS

'Oops, sorry!"

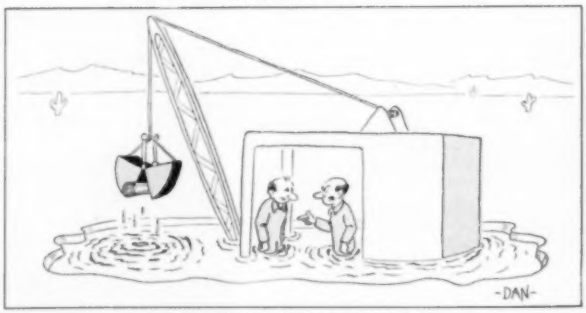
EXCAVATING ENGINEER

"Here comes Hoskins with more pipe now!"



"Anybody we know?"

"Then you aren't the party who ordered sewer facilities for 10,000 people?"



"The whole damn' desert and you have to hit a water pipe!"

New Trade Literature

Continued from page 57

building jobs such as small and large-scale housing, office and factory building, tunnel, highway and dam construction.

Where to get: Engineering Societies Library, 29 West 39th St., NYC 18. ($2.00)

Title: **Installation Manual**

Subject: An illustrated 46-page manual on the installation of drainage products is intended to assist construction engineers, superintendents, and foremen in the proper methods of installing Armco drainage structures, culverts, sewers, or conduits. The manual first discusses the handling of metal drainage products, location, proper excavation and preparation of base in various types of foundation soils and rock. This is followed by detailed instructions for the assembly of corrugated metal pipe, coated or paved pipe, Pipe-Arches, Hel-cor pipe, and Multi-Plate pipe and arches. Next are recommendations for proper backfilling pipe, and arches for various loading conditions. Installation of underdrains to insure proper functioning is also discussed.

Where to get: Armco Drainage & Metal Products, Inc., Middletown, Ohio. (Free)

Title: **½-yd. Excavators**

Subject: Catalog illustrating Wayne Crane ½-yd. crane-excavators. Features laid out include the deck machinery layout, self-leveling chassis, oversize 20-in. clutches, cab and right angle drive mechanism.

Where to get: Wayne Crane Div., American Steel Dredge Co. Inc., Fort Wayne, Ind. (Free)

Title: **Bearing Maintenance**

Subject: A continuing study of bearing maintenance techniques and successful maintenance, installation, and removal procedures is an attempt to publish in permanent form all available maintenance information on every type of bearing. At the present time too many bearings are being replaced for reasons other than normal fatigue which in most cases is due to faulty maintenance practice.

Where to get: Anti-Friction Bearing Distributors Association, Cleveland 15, Ohio. (Free)

Title: **Tractor Catalogs**

Subject: One catalog describes the model HD-9 — weighing 18,500 pounds and developing 70.0 drawbar hp. The other covers the model HD-15 — weighing 27,500 pounds and

If this wire goes into a rope of 6 x 19 Seale Construction with a fiber core, it will be just one of 114. But if it is a "HERCULES" (Red-Strand) Wire Rope, *every* one of the 114 wires will have been rigidly tested to our exacting standards as to *all* essential properties. Furthermore, the rope will have been designed and fabricated according to the most advanced methods of manufacture.

Only by strict adherence to such principles, can the highest quality in wire rope be produced—*consistently*. It is never a matter of chance.

Because of long experience and the exacting care always used in making "HERCULES" (Red-Strand) Wire Rope, you can depend on it for safe and economical service. Made in a wide range of constructions—either Preformed or Non-Preformed, there is, *in this one grade*, a "right rope" for any heavy duty job.

MADE ONLY BY

We Invite Your Inquiries

A. LESCHEN & SONS ROPE CO.

ESTABLISHED 1857 5909 KENNERLY AVE. • ST. LOUIS, MO.

New York 6 · Chicago 7 · Birmingham 6 · Houston 3 · Denver 2 · Los Angeles 21 · San Francisco 7 · Portland 9 · Seattle 4

developing 102.0 hp at the drawbar. Each catalog utilizes double-page spreads to discuss major features of the tractors, such as unit construction, General Motors 2-cycle diesel power, the complete power train, frame and track design. Complete specifications, plus details of allied equipment and special accessories are also included.

Where to get: Allis-Chalmers Tractor Div., Milwaukee 1, Wis. (Free)

RENT INTERLOCKING STEEL SHEET PILING
"FASTER from FOSTER"
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR JOB NEEDS
Foster's lower rental rates on all standard piling sections give you a low fixed expense as an added competitive advantage when bidding on jobs. RENT: Light-weight Corrugated Steel Sheet Piling—Pile Hammers and Extractors.
Send for: Piling Chart EE-7
L. B. FOSTER CO.
PITTSBURGH 30, PA.
NEW YORK 7, N.Y.
CHICAGO 4, ILL.
HOUSTON 2, TEX.

Title: **15-ton Trucks**

Subject: Catalog describes models 80FD and 82FD rear-dump Euclids of 15-ton capacity. Bulletin describes the various features of the off-highway hauling units designed and built for moving earth, rock, ore and other heavy excavation. Powered by Cummins 165-hp or General Motors 190-hp diesel engines, top speed of this unit with 30,000-lb. payload is 21.5 or 26.4 mph.

Where to get: Euclid Road Machinery Co., Cleveland 17, Ohio, or any Euclid distributor. (Free)

Title: **Hydraulic Controls**

Subject: Booklet explains in detail how the three models of hydraulic controls fit the various models of Caterpillar track-type tractors. Arrangements needed to adapt the versatile No. 44 hydraulic control to either the D2, D4 or D6 tractors are itemized in tabular form. Complete specifications for all three controls are included. Several job application pictures indicate the many and varied types of jobs to which these controls are suited. They include types of work ranging from a hydraulically controlled moldboard plow to a Caterpillar D8 tractor and 8S bulldozer spreading and leveling earth fill for a housing development job. Pictorial cutaways show the detailed construction and operating features of the controls and the hydraulic jacks. An explanation of hydraulic balance in the vane type pump shows why the feature is so important to long life.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill., or any Caterpillar distributor. (Free)

Title: **Soil Compaction**

Subject: Five volumes covering soil compaction investigations of the U. S. Army Corps of Engineers: Report No. 1 covers compaction studies of clayey soils. The study method, comprising both field sampling and laboratory testing, is described, and the conclusions reached are given in detail. Report No. 2 relates to compaction studies of silty clay. The nature of the tests sections; field sampling and testing; laboratory tests on field-compacted samples; density tests; California tests; and triaxial compression tests, are all described in detail. Report No. 3 covers two series of tests performed at Elgin Field, Fla., preceding the development of a new runway to withstand 300,000-lb. plane loads. Report No. 4 relates to compaction problems of natural, constructed, and uncompacted silty clay fill subgrades. Preliminary surveys, and actual compaction tests are described. Report No. 5 presents the results of a study to develop a suitable standard compaction test for cohesionless materials. Each report contains photographs, tables and figures.

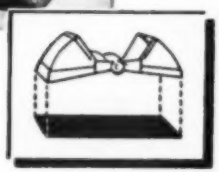
Where to get: Corps of Engineers, Waterways Experiment Station, U. S. Army, Vicksburg, Miss. ($1.00 each)

Title: **Tractor Equipment**

Subject: Two catalogs on tamping rollers and front end equipment. First brochure gives complete description of features such as direct lift, positive down pressure, mobile moldboard, fingertip control, positive hydraulic hold and easy engine accessibility of Baker rootrippers, bulldozers and gradebuilders. Specifications list weight, length of vehicle and blade, length and height of moldboard (or teeth), depth of cutting edge, lift above and drop below ground, maximum track shoe width, maximum blade tilt, minimum and

ERIE *Barge Type* **Bucket**

In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.



Compare **DECK AREA**

¾ Yd.	27.21 Sq. ft.
1 Yd.	30. Sq. ft.
1½ Yd.	32.3 Sq. ft.
1½ Yd.	38.7 Sq. ft.
1¾ Yd.	42.4 Sq. ft.
2 Yd.	45.1 Sq. ft.
2½ Yd.	53.5 Sq. ft.
2½ Yd.	57.6 Sq. ft.
3 Yd.	68.9 Sq. ft.

Write for Catalog **2L-2** *Today*

ERIE
STEEL CONSTRUCTION COMPANY
414 GEIST ROAD • ERIE, PENNSYLVANIA

CUT PREPARATION COSTS UP TO 50% WITH A BUCYRUS-ERIE 42-T

BLAST hole preparation costs reduced as much as 50 percent — that's the record progressive mine and quarry engineers are making with big-hole 42-T blast hole drills. Here's why:

FEWER HOLES NEEDED

By drilling widely spaced 12-inch holes instead of many small close-set holes, less than one-half the drilling is needed to prepare a given volume of rock. Fewer holes mean much less linear footage to be drilled, fewer moves, fewer set-ups and lower drilling costs.

EQUAL OR BETTER FRAGMENTATION

Because powder can be concentrated in larger holes, the blast breaks up material as well or better than with small hole charges —with no increase in explosive per ton of material blasted. With less oversize, secondary blasting is reduced.

REDUCED DEFLECTION AND STICKING

Because of their greater weight and size, large-diameter bits are less likely to stick or be thrown out of line by cracks or fissures. Also, with a big 12-inch hole there is no waste of time and powder due to springing — no "lost" holes.

FASTER DRILLING

Bucyrus-Erie modern 42-T rigs, swinging as much as 6000 lb. of tools, drill big-diameter holes just as fast as smaller outfits drill small-diameter holes. From every angle, the 42-T's big holes save time, labor and cost.

Find out how fast-working Bucyrus-Erie blast hole drills can cut your preparation costs. Write for information on our complete line—42-T for 9 to 12-in. holes; 29-T for 6 to 9-in. holes; 27-T for 6 to 6⅞-in. holes; 22-T for 5⅛ to 6⅞-in. holes.

61B51C

BUCYRUS ERIE SOUTH MILWAUKEE, WISCONSIN

maximum blade angle, and on the root rippers, number of teeth, teeth spacing, and length of teeth below frame. Second bulletin describes sheepsfoot tamping rollers made in single, double and triple drum models, with tandem hitches available for 3-2-1 or 2-1 operation.

Where to get: Baker Manufacturing Co., Springfield, Ill. (Free)

Title: **Labor Relations**

Subject: Manual is designed to put the labor relations and personnel man in touch with some of the more successful techniques worked out by other companies. The name of the company which worked out the individual or collective problem, together with the step-by-step procedure is given. There are enough "know how" tips and aids, ideas and leads in the experiences of others to improve any labor relations program.

Where to get: National Foremen's Institute, Inc., New London, Conn. ($7.50)

Title: **Technical Data Catalog**

Subject: Over 2,000 listings of Lefax pocket-size technical books are contained in the newly revised 1951 catalog. Condensed, mathematically accurate source materials for engineers, construction men, technical students. Of special interest to surveyors is the new Slope Correction Table which gives two minute correction factors for distances up to 1,000 feet. Also newly compiled is a Decimal Trig Table with natural functions worked out to 100th part of degree. Each book consists of approximately 140 pages of easily read tables and data in pocket-size, loose leaf form for handy reference right on the job. Subjects listed in the 1951 catalog include: Hydraulics, Machine Design, Piping Data, Surveying Tables, Metallurgy, Highway Engineering, Metals, Builder's Data, Lumber Data, Reinforced Concrete, Building Construction, Surveying and many others.

Where to get: Lefax Publishers, Philadelphia 7, Pa.

Title: **Tractor Operation**

Subject: Presented in comic-book style, operation know-how on bulldozers, scrapers, rippers and cable controls, plus additional material on high speed hauling, loading, and grade stakes familiarization is explained. Designed to make operation of Caterpillar earthmoving equipment easy to understand, the book shows many of the techniques in earthmoving operation as compiled by operators and engineers in the field. It explains when to use bulldozers, how to pioneer side hill cuts, push loading, rock and tree removal, soft fill work, do's and don'ts of proper tractor-dozer adjustment and operation, and other earthmoving applications. Techniques are simplified through the use of familiar scenes in the cartoon illustrations which show the operator how to get the best performance and job application possible. It tells the story through a typical job foreman who talks about the various techniques needed for efficient tractor-dozer operation. This book may be of special value to the military in teaching proper equipment operation to inexperienced men.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill. (Free)

Title: **Diesel Catalog**

Subject: Book covers single and multiple engine units from 2 to 24 cylinders with power ranging from 32 continuous to 780 intermittent hp. It contains data on GM diesel 2-cycle design and interchangeability of parts; a chart covering 57 standard power take-off and 7 torque convertor models; engine illustrations and an outline of Detroit Diesel service facilities.

Where to get: Detroit Diesel Engine Div., Detroit 28, Mich.

WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts? Write for free descriptive bulletins

Dragline, Clamshell, Custom-Built Buckets Stone and Wood Grabs

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

Lima 2400 shovel equipped with 50 foot boom, 40 foot sticks and 5½ cu. yd. dipper. Location Central United States. Address inquiries to Box No. 3435.

FOR SALE

750-B BUCYRUS-ERIE 16 cu. yd. electric shovel, full Ward-Leonard.

9-W BUCYRUS-ERIE 7 cu. yd. dragline, 200 foot boom, full Ward-Leonard.

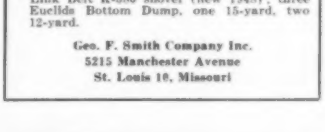
Both machines will become available in September, 1951. Good stock of spare parts. Located in Middlewest. Inquiry Box No. 3438, c/o EXCAVATING ENGINEER.

1—31-B Bucyrus-Erie steam shovel.
1—120-B Bucyrus-Erie steam shovel.
1—No. 490 Marion electric shovel.
50-B steam shovel new parts.
50-B boom and dipper handles.

New York Trap Rock Corporation
230 Park Ave. at 46th St., New York 17, N. Y.

Northwest 80-D combination shovel-dragline; Link Belt K-580 shovel (new 1948); three Euclids Bottom Dump, one 15-yard, two 12-yard.

Geo. F. Smith Company Inc.
5215 Manchester Avenue
St. Louis 10, Missouri



2 cu. yd. shovel front attachment for 44-B Bucyrus-Erie, complete with chain, gears, etc. $4000.
Vulcan drop and steam or air hammers.
McKiernan 9-B-2, 6 and 5 pile driving hammers.
McKiernan E-2 pile extractor.
For detailed description and prices write:

Price Brothers Company
P.O. Box 825 Dayton 1, Ohio Ph. Hemlock 7861

Thew ¾-yd. crawler shovel with dragline bucket and 40-ft. boom. Powered by 100-HP Waukesha gasoline motor.

Davies Brick Company
Enid, Oklahoma

LIMA MODEL 802

Combination shovel, clamshell, dragline, 40" treads, 50' boom with 20' insert. Caterpillar D17000 engine, 2 cu. yd. shovel dipper. New October 1945. Location New York. Priced right. Inquire Box 3432, c/o Excavating Engineer.

Used, one-yard Osgood combination shovel and dragline by contractor. Good condition. Location Kansas. Reply Excavating Engineer, Box 3440.

Northwest model 25; 6; 80D; 95. Manitowoc 6500; 4500 new — will rent. Bucyrus 54-B; Monighan 5W; 7W; 9W; 450.

A. W. Nevers Phone 32 Mt. Pleasant, Iowa

Fairbanks-Morse diesel engine model 44-He10-300 h.p. for 5-W Bucyrus-Monighan dragline. This engine rebuilt under supervision of Fairbanks-Morse engineers and not used since being rebuilt. Details furnished upon request.
Box 3441

Shovels, draglines, cranes, B-E 200B, 120B, 54B, 48B, 51E, 50B, 38B, GA-3.
Walking draglines, diesel, elec., 6 and 3-yd.
Euclids, Sterlings, Macks, 10, 12, and 21-yd.
Locomotives, 7 to 45-ton, diesel, gas, stm.
Diesel elec. generating sets, 100 to 875 KW.
Crushers, gyratory and jaw, large (7).
Marion 5320, 8-yd. electric shovel.
Koehring WD60 Dumptors; Super C Tournapulls.
Trench excavators, Buckeye, Parsons (6).
Telsmith crushing, screening, wash plant.
Batching plants; cement silos; aggregate bins.
LaPlant-Choate T300 15-yd. motor scrapers (5).
Drop bottom coal cars, 36" ga., 15-ton (40).
Rotary dryers, kilns (6).
B-Erie shovel front att., 2¼-yd., 52B-55B.

H. Y. Smith Co., 828 N. B'way, Milw. 2, Wis.

New Dragline Buckets

2½ cubic yard Type AX dragline bucket. (Reconditioned.)

3 cubic yard Red Arch, Type AY heavy duty bucket.

Bucyrus-Erie Company
Parts Division
South Milwaukee, Wisconsin

Used 10-B shovel attachment for sale or trade for 10-B dragshovel attachment. Box 3442

Bay City model 65 gasoline D/L and D/S. Recently completely overhauled. Price $19,000 net to owner. Located Michigan. Box 3437

TOURNAPULLS IMMEDIATELY AVAILABLE. Three units model C1 Tournapulls, mounted on two 21:00 x 24:00 20-ply tires with model LP scrapers. Thoroughly reconditioned ready to roll. $6500 each. Loaded on cars.

H. O. Penn Machinery Company, Inc.
140th St. and East River
New York 54, N. Y.

Model 201 Buckeye Ditcher, Twin City gas engine, 27 foot max. cut. Ladder type. Machine in good condition throughout. Located in Oklahoma.

Pennington-Winter Constr. Co.
P.O. Box 5051 Oklahoma City 2, Okla.

May We Help You?
If you do not find the equipment you want listed in these columns, write to:

Excavating Engineer
South Milwaukee Wisconsin

Six Esco heavy duty dragline buckets 1⅝ cu. yds. complete with renewable manganese steel inserts for back and bottom. Five of these buckets are brand new, the other one has worked for only approx. 100 hours. Bucket spares, specifications as follows: two E-7049-B RH wearing shoes; two E-7050-B LH wearing shoes; four A-6086 lower hoist chains No. 4; four A-6086 No. 3 upper hoist chains; two E-8775 hitch plate extensions; sixteen E-3496 trunnion pins; four A-9218 No. 4 drag chains; sixteen E-8639 trunnion link pins; sixteen E-6964 spreader bar pins; eight 1⅜" S.D. hitch shackles; eight E-7594 S.D. hitch shackle pins; eighty C-32-B keys; one A-5277 No. 1 dump sheave pin; two A-5766 No. 2 roller bearings; eight A-4436 No. 1 retainers; eight A-4437 No. 1 retainer locks; four E-8900 lower hitch pin heads; eight E-7351 hitch plate extension bushings; eight E-3848 dump rope socket wedges; sixty-six No. 5 pins; sixty-six rubber plugs; eight C-50-B S.D. hitch shackle pin keys; four S-4181 upper dump rope sockets; two E-9183 drag rope sockets; two S-8 drag rope socket wedges; two E-4696 drag rope socket pins; two A-6355 No. 2 drag rope socket pin locks; two E-5242 dump rope sockets; two E-3848 dump rope socket wedges; two E-5243 dump rope socket pins; two A-6355 No. 2 dump rope socket pin locks; two E-5241 triangle plates; two E-7169 hitch chain shackles; two E-5244 hitch chain shackle pins; two A-6355 No. 2 hitch chain shackle pin locks; twenty-four C-33-C, two teeth; twenty-eight C-33-ACR-5 adapters; seventy-four R-5 points; 250 WOR-5 Weld-on points.
One 60' P&H No. 855 model dragline boom, brand new.
Clamshell equipment for dragline machine, including two new drums, new A-frame head, one additional sheave for boom point, new top boom section. Closing and holding ropes and tagline equipment.
Clamshell equipment for dragline lifting crane machine. Boom point sheave and guard, tagline equipment ropes for 45'0" boom. Box 3436

Continued on page 64

For Sale

Continued from page 63

50% Discount

Genuine Hendrix Unused Dragline Parts for Bucket Sizes

3/8 yd. to 2½ yd.

LIPS—TEETH—CHAINS PINS—ETC.

Write for Complete List

Quick Service Co.
1226 West Adams Street
Chicago, Illinois

7—all-steel rocker dump cars, roller bearing, 30" gauge, 1 yd. 7 tons steel rails, 16 to 30 lb, straight and serviceable with 8 switches. One Bucyrus-Erie scraper, 4½ yd., 4-wheel. All of above in excellent condition.

Kentucky Clay Mining Company
Mayfield, Kentucky

WANTED

WANTED

3 to 5 yard CRANE. To Rent for Use in Detroit Area.

Box 3433

EQUIPMENT WANTED

Wanted: Auxiliary drum unit with operating levers for 42-B Bucyrus-Erie steam crane.

Fehlhaber Pile Company, Inc.
295 E. 42nd Street
New York 17, New York

HELP WANTED

DREDGE MASTERS

Two experienced dredge masters for placer dredges owned and operated by internationally-known company. Location, South America. Excellent opportunity for steady work for men who can qualify. For further information, write to Box 3439.

EXPORT SERVICE ENGINEER required by manufacturer of tractor equipment. Should be well advised on crawler tractors and allied equipment. Must be willing to travel abroad. Box 3431

May We Help You?
If you do not find the equipment you want listed in these columns, write to:
Excavating Engineer
South Milwaukee Wisconsin

POSITIONS WANTED

Gen. supt. or supt. available. Experience covers 25 year supervising, estimating and building all classes of excavating; railroads; highways; airports; earth-fill dams; large sewers. Honest, sober, reliable. Best of references. Box 3429

Power shovel and excavating equipment operator. A-1 mechanic. Will go anywhere. Now located in Maryland. Box 3431

Position wanted as shovel operator. Can operate any make of machine; shovel; dragline; clamshell, or crane. Steam, gas, diesel, or electric. Large or small machines. Also experienced on water well rigs. Virgil Dick, P.O. Box 8, Hurricane, West Virginia. Phone 2224.

If You Are Buying Or Selling Used Equipment This Is the Place to Let the Excavating Industry Know About It.

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD CO.
52-54 Church Street
New York, N. Y.

"Well, there goes our safety engineer."

It's a cinch for a winch on TIMKEN® bearings

WITH 10 Timken bearings used on the winch of this new Wooldridge "Terra Cobra" earthmover, heavy pay loads are no problem—whether you're stripping coal in Pennsylvania, moving silt on a levee in Nebraska, or landlevelling an airport in Los Angeles. Timken® bearings are also used on the differential, pinion shafts, jackshaft, drive wheels and rear wheels of the Terra Cobra to assure long life and trouble-free operation. In all, there are 23 Timken bearings used throughout the Terra Cobra to keep it on the job and working to capacity.

Timken bearings are made of the finest steel ever developed for tapered roller bearings—Timken fine alloy steel. Under normal conditions, they last the life of the machine. Line contact between the rollers and races gives extra load carrying capacity. Under the toughest loads Timken bearings operate freely and frictionlessly because of their true rolling motion and incredibly smooth surface finish.

Timken bearings permit the use of tighter, lubricant-retaining closures that keep dirt and moisture out, keep the lubricant in—saving both maintenance time and materials. Tapered construction enables them to take any combination of radial and thrust loads without end-movement or deflection.

No other bearings can give you *all* the advantages you get with Timken bearings. They're industry's first choice and are backed by 50 years of bearing research and development. Insist on bearings with the trade-mark "Timken" whether you buy or build machinery. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **WOOLDRIDGE MANUFACTURING COMPANY** *mounts moving parts of the Terra Cobra winch on Timken bearings to insure minimum maintenance, long years of dependable service.*

NEW ENGINEERING JOURNAL!

529 PAGES! Includes new, technical information on bearing applications available nowhere else. Especially helpful to design engineers. Gives bearing dimensions, capacities, selection and mounting data. For a copy, write on your company letterhead to The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST ▯ LOADS OR ANY COMBINATION ✳

HAZARD

LAY-SET PREFORMED

the Premium BRAND

Only the finest is branded "*Premium.*" Only the best gets the blue ribbon for unequalled quality. Only one is recognized as the grand champion winner which sets the standards of excellence . . . whether it's beef on the hoof, a beauty contest winner, or a brand of wire rope.

HAZARD since 1846 has produced premium wire rope . . . made better so that it will last longer, handle safer, and cost less to use. LAY-SET Preformed has been used —with excellent results—in every conceivable type of wire rope service. Its satisfactory performance has proved LAY-SET's right to be called—"*the Premium Brand.*"

There is a HAZARD distributor near you to serve you with this premium brand of wire rope.

ACCO *In Business for Your Safety*

AMERICAN CHAIN & CABLE

HAZARD WIRE ROPE DIVISION

ALSO MAKERS OF THE COMPLETE LINE OF Registered WIRE ROPE SLINGS

TRADE MARK

Wilkes-Barre, Pa. · Chicago · Denver · Houston · Los Angeles · New York · Odessa, Tex. · Philadelphia · Pittsburgh · San Francisco · Bridgeport, Conn.